

DIV. OF FISHERIES

# COMMERCIAL FISHERIES REVIEW

THE UNIVERSITY  
OF MICHIGAN  
JAN 17 1961

MUSEUMS



Vol. 22, No. 12

DECEMBER 1960

FISH and WILDLIFE SERVICE  
United States Department of the Interior  
Washington, D.C.

# COMMERCIAL FISHES

OF THE ATLANTIC COAST OF NORTH AMERICA

BY  
J. S. GILBERT  
U. S. FISH COMMISSION  
BUREAU OF FISHERIES  
WASHINGTON, D. C.  
1908

Published by the U. S. Government Printing Office  
For sale by the Superintendent of Documents  
Washington, D. C.



UNITED STATES  
DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE

ARNIE J. SUOMELA, COMMISSIONER

DEPOSITED BY THE  
UNITED STATES OF AMERICA

BUREAU OF COMMERCIAL FISHERIES

DONALD L. MCKERNAN, DIRECTOR

DIVISION OF RESOURCE DEVELOPMENT

RALPH C. BAKER, CHIEF



# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

Publication of material from sources outside the Bureau is not an endorsement. The Bureau is not responsible for the accuracy of facts, views, or opinions contained in material from outside sources.

Although the contents of the publication have not been copyrighted and may be reprinted freely, reference to the source is appreciated.

Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

5/31/63

## CONTENTS

COVER: The 150-foot Soviet factoryship *Беринг* No. 395 illustrates the rapid advances the Soviets have made in modernizing their fishing industry. This factoryship, with a speed of 10-12 knots, was operating in the Bering Sea (south of Nunivak Island) in the fall of 1960 as part of a large fleet of catcher vessels, factoryships, and auxiliary vessels.

Page	
1	Observations of Russia's Far Eastern Fisheries Activities, by Charles Butler
16	Down With Rejects--Up With Profits, by R. T. Whiteleather

Page	
	<b>TRENDS AND DEVELOPMENTS:</b>
	Fishing Vessel and Gear Developments:
20	Equipment Note No. 6--Chain Bridges and Accumulators Increase Effectiveness of "Fall River" Clam Dredges in Deep Water, by Francis J. Captiva
22	Equipment Note No. 7--Space-Saving Chart Table Installed on Seattle Trawler <i>Sunbeam</i> , by Richard L. McNeely
	<b>Alaska:</b>
23	New Film Illustrates King Crab Fishing Industry of Kodiak Region
23	Survey of Subsistence Fishing Made on Kuskokwim River
	<b>Antarctica:</b>
24	Worm Parasites of Polar Fishes to be Studied
	<b>California:</b>
25	Recoveries of King Salmon Marked in 1959 to Determine Migration Hazards
25	Trawling Gear Tested on Dungeness Crabs (M/V <i>Nautilus</i> Cruise 60N5)
26	Investigation of Abalone Resources Continued (M/V <i>Nautilus</i> and Diving Boat <i>Mollusk</i> Cruises 60N7, 60N8, and M/V N. B. Scofield and Diving Boat <i>Mollusk</i> Cruise 60S4, 60M5)
26	Albacore Tuna off Southern California Studied (M/V <i>Nautilus</i> Cruise 60N8)
27	Pelagic Fish Population Survey Continued (M/V <i>Alaska</i> Cruise 60A7)
28	Cans--Shipments for Fishery Products, January--August 1960
	<b>Central Pacific Fishery Investigations:</b>
28	Experimental Net Fishing for Skipjack Tuna (M/V <i>Charles H. Gilbert</i> Cruise 49)
28	Fishery Research Vessel <i>Charles H. Gilbert</i> on 50th Voyage
29	Research on Hawaiian Tuna Fishery Bait Problems
	<b>Federal Purchases of Fishery Products:</b>
30	Department of Defense Purchases, January--September 1960
	<b>Fish Meal:</b>
30	Research on Nutritive Value
	<b>Fisheries Loan Fund:</b>
31	Fisheries Loans Approved July 1 to September 30, 1960
	<b>Fur Seals:</b>
31	Alaska Fur-Seal Skin Harvest for 1960 Lower

Page	
	<b>TRENDS AND DEVELOPMENTS (Contd.):</b>
	<b>Fur Seals (Contd.):</b>
32	Economic Study of Seal Skin Prices Initiated
32	Prices for Alaska Fur-Seal Skins at Fall 1960 Auction Higher
	<b>Great Lakes Fisheries Exploration and Gear Research:</b>
32	Seasonal Distribution Studies of Commercial Fish Stocks in Lake Erie Continued (M/V <i>Active</i> Cruise 12)
	<b>Great Lakes Fishery Investigations:</b>
33	Lake Erie Population Survey (M/V <i>Musky II</i> September 1960)
34	Lake Michigan Fish Population Survey Continued (M/V <i>Cisco</i> Cruise 8)
34	Western Lake Superior Fishery Survey Continued (M/V <i>Sisowet</i> Cruises 6 and 7)
35	Sea Lamprey Control for 1960 Season Ended
	<b>Gulf Exploratory Fishery Program:</b>
36	Bottom Formations Surveyed and Variable Pitch Propeller Tested (M/V <i>George M. Bowers</i> Cruises 29 and 30)
36	Mississippi Delta Area Surveyed for Sardine-Like Species (M/V <i>Oregon</i> Cruise 70)
	<b>Irradiation Preservation:</b>
37	Market Feasibility Study for Irradiated Fishery Products Under Way
	<b>Maine Herring Investigations:</b>
37	Recoveries from Tagging Aid Studies
	<b>North Atlantic Fisheries Exploration and Gear Research:</b>
37	Exploratory Fishing Vessel <i>Delaware</i> Back on Schedule
	<b>North Atlantic Fishery Investigations:</b>
38	Survey of Distribution and Abundance of Groundfish in Inshore Nursery Areas Continued
	<b>Omaha, Nebraska:</b>
38	Consumption of Frozen Fish and Shellfish in Restaurants and Institutions
	<b>Oregon:</b>
39	New Shrimp Trawling Grounds Found off Coast
39	Salmon Rearing Lake Construction Begins
	<b>Oysters:</b>
40	Maryland Observations on Spawning and Setting as of October 1, 1960
41	Standards Research Program Shifted from Virginia Laboratory

Contents Continued pages II and III.

## CONTENTS (CONTINUED)

Page	TRENDS AND DEVELOPMENTS (Contd.):	Page	FOREIGN (Contd.):
	Scallops:		Canada:
41 ..	Calico Scallop Fishery in Florida	57 ..	British Columbia Vessels Fish for Tuna off California Coast
42 ..	Chemical Composition to be Studied	57 ..	Fish Meal and Oil Production, 1958-59
42 ..	Landings from Georges Bank to be Lower in 1961	57 ..	Labeling Requirements for Canned Sardines Announced
	Shrimp:	58 ..	Outlook for the Georges Bank Scallop Fishery, by N. Bourne
43 ..	Louisiana Initiates Marking Program	59 ..	12-Mile Fishing Limit Under Consideration
	Sport Fishing:		Cuba:
43 ..	Almost Twenty Million Fishermen in 50 States	60 ..	Program to Build 570 New Fishing Vessels Announced
	Tuna:		Denmark:
44 ..	Progress Made in Studies on Composition	60 ..	Dispute Over Profit-Sharing Between Vessel Owners <sup>1</sup> and Crews at Esbjerg Ends
44 ..	U. S. Fishery Landings, January-August 1960	70 ..	Foreign Trade in Fish Meal and Marine Oils, 1959
46 ..	United States Fishing Fleet Additions, July and August 1960		Ecuador:
	U. S. Foreign Trade:	71 ..	Fish Meal and Oil Industry
48 ..	Edible Fishery Products, August 1960		Egypt:
47 ..	Imports of Canned Tuna in Brine Under Quota	72 ..	Loan by United States to Aid Shrimp Freezing Firm
47 ..	U. S. Production of Fish Sticks and Portions, July-September 1960	72 ..	Import Licenses for More Japanese Canned Fish Issued
49 ..	Wholesale Prices, October 1960		German Federal Republic:
	American Samoa:	73 ..	Fish-Meal Production, Foreign Trade, and Consumption
50 ..	Tuna Landings, September 1960	73 ..	Foreign Trade in Marine-Animal Oils, 1958-1959
	Whiting:	74 ..	Imports, Exports, and Production of Edible Fish Oils, 1957-59
50 ..	Fish Held in Refrigerated Sea Water Stays Fresh Longer	76 ..	Funds for the Support of the Fishing Industry
	FOREIGN:	77 ..	New Type Canned Fish Container Developed
	International:		Hong Kong:
51 ..	Concurrent OAS and FAO Conferences on Agriculture: Significant Factors in Fisheries Development	77 ..	Shrimp Exports and Re-Exports, 1952-1959 and January-June 1960
	European Common Market:		Iceland:
51 ..	Effects of EEC and EFTA on Scandinavian Fisheries	77 ..	Ex-Vessel Price for South Coast Herring Higher
	European Free Trade Association:	78 ..	Fisheries Trends, Second Quarter 1960
52 ..	Import Tariffs Reduced		India:
	Fishing Limits:	78 ..	Japanese to Aid in Development of Fisheries
52 ..	Iceland-United Kingdom Negotiate on Fishing Limits	79 ..	Shrimp Production and Foreign Trade, 1959
52 ..	Britain Agrees to Recognize Norway's Fishing Limits		Israel:
	Food and Agriculture Organization:	79 ..	Fishing Industry Suffers Reverses
53 ..	Meeting on Fisheries Credit Held in Paris		Italy:
55 ..	Plan to Standardize Names of Mediterranean Fish	80 ..	Fish-Body Oil Prices as of September 1960
	General Fisheries Council for the Mediterranean:	80 ..	Tuna Imports and the Common Market
55 ..	Two New Fishery Projects Urged by Council		Japan:
56 ..	Canning and Migration Studies of Mediterranean Tuna Planned for 1961-62	81 ..	Exports of Canned Tuna (Excluding Tuna in Brine), 1956-59
	Great Lakes Fisheries Commission:	81 ..	Exports of Canned Fishery Products, January-May 1959-60
56 ..	Canada Appoints New Commissioner	82 ..	Tuna Vessels Operating in the Atlantic Ocean
	International Association of Fish Meal Manufacturers:	82 ..	Import Restrictions Removed on Some Fishery and Related Products
56 ..	Industry Problems Outlined at Paris Conference	82 ..	Marine-Oil Exports and Consumption, 1958-59
	International Conference on Fish in Nutrition:	82 ..	Salmon Shark Exports to Italy Increase Sharply
57 ..	United States Fishing Industry Pledges Support to Conference		Mexico:
	International Cooperation Administration:	83 ..	Foreign Trade in Marine Oils
58 ..	Sponsors Study of Marine Resources off Coasts of Vietnam and Thailand	83 ..	Shrimp Fishery Trends, Mid-September 1960
	International Council for the Exploration of the Sea:	84 ..	West Coast Shrimp Fishery Trends
58 ..	Cold-Water Flow from Arctic Ocean Into Northeast Atlantic Affects Area's Fisheries		Netherlands:
	International North Pacific Fisheries Commission:	85 ..	Bills Passed Approving Withdrawal from Whaling Convention and Regulating Antarctic Whaling
59 ..	Seventh Annual Meeting in British Columbia		Norway:
60 ..	Italy-Yugoslavia Renew Fishing Agreement	85 ..	Fish Meal Production, 1958-60
	West European Fisheries Organization:	85 ..	Foreign Trade and Production of Marine Oils, 1956-1960
60 ..	West European Fishery Community Proposed	87 ..	Conditional Readherence to International Whaling Convention Announced
	Whaling:	87 ..	Whaling Crews Receive Wage Increase
61 ..	Antarctic Whale Catch for 1959/60 Season Exceeds Quota		Peru:
61 ..	Commission Meets in London	87 ..	Exports of Marine Products, January-June 1959 and 1960
	Angola:	87 ..	Fishing Vessel Fleet as of July 1960
63 ..	Fisheries Production and Exports, 1958-59		Philippines:
64 ..	Fish Meal Industry Trends, First Half of 1960	88 ..	Canned Fish Retail and Wholesale Prices, May 3-July 1, 1960
	Argentina:		Portugal:
64 ..	Import Surcharges Removed on New Fishing Vessels	88 ..	Canned Fish Exports, First Half 1960
65 ..	First Two Fishing Vessels Imported Under New Decree	88 ..	Canned Fish Pack, First Half 1960
	Australia:	88 ..	Fisheries Trends, Second Quarter 1960
65 ..	New Spiny Lobster Fishery Regulations for Western Australia		Spain:
	Bahama Islands:	89 ..	Balearic Islands Shrimp Fishery
66 ..	Fisheries of the Turks and Caicos Islands		U. S. S. R.
	Belgium:	89 ..	New Freezer-Factoryship Completed
66 ..	Canned Fish and Shellfish Offering Prices to Antwerp Importers		United Kingdom:
	British Guiana:	89 ..	Fish Meal Production and Foreign Trade, 1955-59
66 ..	New Policy to Encourage Development of Fishing Industry		

## CONTENTS (CONTINUED)

Page		Page	
	FOREIGN (Contd.):		FEDERAL ACTIONS (Contd.):
	United Kingdom (Contd.):		Supreme Court:
90 ..	Crude Whale and Herring Oil Utilization Increased	95 ..	Gulf States Request Reconsideration of Decision on Offshore Boundaries
90 ..	Effect of Preservatives on Fish Meal and Oil Quality	95 ..	Eighty-Sixth Congress (Second Session)
90 ..	New Freeze-Drying Process Increases Shelf Life of Foods		FISHERY INDICATORS:
91 ..	New Plant to Produce Frozen-Fish Dinners	97 ..	Chart 1 - Fishery Landings for Selected States
91 ..	Review of Research on Fishery Byproducts	98 ..	Chart 2 - Landings for Selected Fisheries
93 ..	Ultraviolet Light Used for Purification of Oysters	99 ..	Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products
	FEDERAL ACTIONS:	100 ..	Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers
	Department of Health, Education, and Welfare:	100 ..	Chart 5 - Fish Meal and Oil Production - U. S. and Alaska
	Food and Drug Administration:	101 ..	Chart 6 - Canned Packs of Selected Fishery Products
94 ..	Color Additives Regulations Issued	102 ..	Chart 7 - U. S. Fishery Products Imports
	Department of the Interior:		RECENT FISHERY PUBLICATIONS:
	Fish and Wildlife Service:	103 ..	Fish and Wildlife Service Publications
	Bureau of Commercial Fisheries:	105 ..	Miscellaneous Publications
94 ..	Frozen Ocean Perch and Pacific Ocean Perch Fillets		
	Voluntary Grade Standards Proposed		
95 ..	New Alaska Regional Director Named		



## SALMON CANNED FIRST IN SCOTLAND

"One of our most important fish-canning industries, namely salmon, had its beginning during the Civil War period. Salmon is said to have been canned first in Aberdeen, Scotland, in 1824 and it is claimed that the first salmon canned on the American continent was packed at St. Johns, N. B., in 1839 and in Maine shortly after this time. However, it was never packed on an extensive scale as were lobster and oysters. . . The industry had its real beginning in California, first became important on the Columbia River and reached full development when salmon canning spread to British Columbia, Alaska, northern Japan and Siberia in order named." (Principles and Methods in the Canning of Fishery Products, Research Report No. 7, page 2, U. S. Fish and Wildlife Service.)

---

Editorial Assistant--Ruth V. Keefe

Compositors--Jean Zalevsky, Alma Greene, Janice Poehner, and Helen Joswick

\*\*\*\*\*

Photograph Credits: Page by page, the following list gives the source or photographer for each photograph in this issue. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

Pp. 20 and 42--J. B. Rivers (Brunswick); p. 21, and p. 22, fig. 3--Drawings by B. O. Knake (Pascagoula); pp. 36 and 37--Basil L. Smith System, Phila., Pa.

---



# COMMERCIAL FISHERIES REVIEW

December 1960

Washington 25, D. C.

Vol. 22, No. 12

## OBSERVATIONS OF RUSSIA'S FAR EASTERN FISHERIES ACTIVITIES

By Charles Butler\*

### BACKGROUND

The purpose of the visit of the United States delegation to the Far East of the U.S.S.R. was to observe the fisheries and to obtain samples of salmon of known history from Russian sources for the studies under way at the U. S. Bureau of Commercial Fisheries Seattle Biological Laboratory. The studies are related to the high-seas fishing problems of the North Pacific Salmon Commission's activities.

The United States delegation was made up of Clarence Pautzke, of the Washington State Department of Fisheries, an expert on fish hatcheries; W. C. Arnold, of the Canned Salmon Industry; Wm. Barlow, interpreter; Clinton Atkinson, in charge of the Bureau's biological research laboratory in Seattle, Wash.; and Charles Butler, head of the delegation, from the Bureau's Division of Industrial Research, Washington, D. C.

The delegation left Washington, D. C., on August 20, 1959, and arrived in Moscow, via Paris, on August 22. We conferred with the full Soviet State Scientific Committee (sponsors of our visit) regarding details of the projected trip and other fishery matters of mutual interest. After a tour of the permanent Moscow exhibit of Science and Agriculture, we left that evening for the Russian Far East. On the evening of August 23 we arrived at Khabarovsk, having been delayed en route (at Omsk and Irkutsk) by bad weather. After the welcoming banquet, we met the additional members of the Russian party with whom we were to travel.

Early on August 24, 1959, we left Khabarovsk aboard a two-engine propeller plane. The flight was approximately north, along the Amur River Valley, then across the Sea of Ohkotsk to the village of Ohkotsk.

### VISIT TO THE OHKOTSK FISHING COMBINE

A welcoming party, including the Director of fishing activities of the area, escorted us to a nearby house for a breakfast banquet and discussion session. We then went by bus and ferry to the nearby fishing combine headquarters, some two miles from Ohkotsk.

This combine was largely inactive as the salmon season was over. We visited the saltery facilities, the principal source of fishery products. No canning is done there. Salmon and herring are salted during a season of about five months. Fixed gear (traps) is used for salmon fishing along the ocean front. Salmon processed annually totals about 1,300 tons, half chum, half pink. The recent decline in salmon catches was blamed on Japanese high-seas fishing activities.

There is no harbor or in-shore moorage. Vessels anchor offshore and lighter cargo to and from shore. There was little evidence of other means of livelihood except fishing. The

\*Saltonstall-Kennedy Coordinator, Division of Industrial Research, U. S. Bureau of Commercial Fisheries, Washington, D. C.

Note: Also see Commercial Fisheries Review, December 1959 p. 71, October 1959 p. 39.

U. S. DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
SEP. NO. 605



combine operates its own cooperage shop, making tierces and boxes for salt salmon and her-  
ring, kegs for salmon caviar, and boxes for frozen fish (usually flatfish). The operation was



Fig. 1 - Pump house on beach at Ohkotsk delivers salmon to plant.

on a rather large scale, with evidence of recent upgrading of buildings and equipment. Type of construction was planted poles for support members, hewn timbers for the structure proper, and rough-sawed lumber for roof and side walls. Floors were of concrete, with salting vats built into them. Good workmanship was evident despite primitive type of structures. There was some use of mechanical conveyors and flumes for mov-



Fig. 2 - Salmon are flumed to dressing plant, Ohkotsk Combine.



Fig. 3 - Close-up of fish conveyor, Ohkotsk combine.



Fig. 4 - Fish conveyor under construction, Ohkotsk Combine.



Fig. 5 - Reed mats hold fish under salt brine, Ohkotsk Combine.



Fig. 6 - Workers at fish salting, Ohkotsk Combine.



Fig. 7 - Woman worker checking trimmed barrel, Ohkotsk Combine.

ing the fish. Plenty of labor was in evidence, with women apparently being used for many of the jobs.

The cold storage was a good one, except for the wood construction, with cork insulation. There must be considerable difficulty with frosting in the freezer and frozen storage areas. Most of the area we visited was for chilled storage of salted fish and salmon caviar.

#### REFRIGERATED CARRIERS PROVIDE OPERATIONAL BASE AROUND OHKOTSK SEA

Travel between the principal fishing ports around the rim of the Sea of Okhotsk and to the southward into the Sea of Japan was by refrigerated carrier vessel. We first went aboard such a vessel, the M/V Tuloma, on the evening of August 24 in the roadstead off the town of Okhotsk. This vessel, and a sistership, the M/V Kuloy, served as our floating home away from home for the better part of 18 days. They were most enjoyable bases of operations.



Fig. 8 - View aft from boat deck, M/V Tuloma.



Fig. 9 - View from bridge, showing bow of M/V Tuloma.



Fig. 10 - View of cargo winches and hatch, M/V Tuloma.



Fig. 11 - View of main deck showing cargo boom and winch, M/V Tuloma.

**DESCRIPTION OF REFRIGERATED CARRIERS:** There are five refrigerated carriers in the fleet that plies out of Nakhodka-Vladivostok to the many towns and villages, accessible only by this means for much of their inbound supplies and for outbound transport of products prepared for sale. Each vessel makes a swing around an assigned route once a month, including about one week of loading and unloading time at Nakhodka.

Total vessel complement is 58, with a Captain and 5 mates on deck, 5 mates in the engine room (one is a refrigeration engineer), and 3 women in the steward's department. Some of the women crew members did the purchasing of the food supplies for the ship, and others were responsible for checking cargo on and off the vessel.

The vessels have the usual navigational aids--radar, direction finder, radiotelephone and telegraph, visual and recording depth-sounders, fire-warning system, etc.

Refrigeration is by the compression system, with 4,500 cubic meters of refrigerated space. There are five cargo hatches. Main propulsion is by slow-speed Diesel, as are the electric generator auxiliaries. Deck winches and most other powered equipment are electric.

**PLACE OF REFRIGERATED CARRIERS IN FISHING INDUSTRY:** The season for hauling salmon is May to September. Balance of the year's cargo (inbound) is crab, herring, and flatfish. The cargo is consigned to cold-storage warehouses along the docks, usually at Nakhodka, but Vladivostok and Khabarovsk are alternative ports. Refrigerated trains take shipments, via the Trans-Siberian Railroad, to Moscow in 10 days. A mechanical refrigeration car is put on the line with 10 refrigerator cars on each end of it. Cold air is driven through these cars via connecting ducts. There were said to be individually-equipped mechanical refrigeration cars, but we saw in our visit to Nakhodka only the multiple-car type just described. Dry ice or salt-ice refrigeration was said to be used for shorter-distance shipments.

#### THE OCTOBER FISHING COMBINE

On August 28 we landed near Ust Bolsheretsk, at the southwest tip of the Kamchatka Peninsula, and conferred with the principal factors of the October Fish Combine. U. C. Kuznetsov, the Director, presided at a discussion of the combine's activities.

Canning was one of the principal activities, with chunk and pink salmon the predominant species taken. Recently those fish have been less abundant. Open-ocean fishing has had to be initiated for salmon, herring, cod, and flatfish to maintain the combine.

Present facilities include:

1. Cannery for salmon and "cambala" (flatfish).
2. Can factory.
3. Freezing and frozen storage plant.
4. Saltery, for salmon and herring.
5. Salmon caviar plant.
6. Floating vessel repair and machine shop.



Fig. 12 - Close-up of frame-construction house, October Fish Combine.



Fig. 13 - View of floating vessel repair shop, October Combine.



Fig. 14 - Fishing vessel hull repairs under way, October Combine.

Salmon fishing is conducted along the 35 kilometers of ocean beach assigned each combine. Fixed (floating) gear, not unlike the Alaska salmon trap, is used. In some instances, the heart or pot is disconnected and towed to the offshore floating pumping station and the fish are received at the cannery or saltery bins alive. In other instances, the trap is "brailed" by the crew of one small boat pulling the web into this boat, thereby working the fish into the opposite end at which a second boat is moored. The fish are transferred to the second boat and from there are taken to the factory for processing. At some times, during the season,



fishing for salmon is permitted with non-fixed gear in the river. We saw a haul- or beach-seining operation at one point (to supply us with live fish for blood samples). A fisherman, engaged in some form of gill-net operation, was also observed along the river bank. The latter activity was said to be "for personal use."

#### SALMON CANNING PROCEDURES:

The canning operation here annually resulted in 34,500 cases (48 1-lb. cans) of salmon. Species are not segregated in their pack reports. Silver salmon is now the dominant species whereas pink salmon was formerly the major variety.



Fig. 15 - Natural ice storage pit. October Combine.



Fig. 16 - Ice-crusher, in storage pit, October Combine.



Fig. 17 - Crew working "fixed-gear" for salmon, October Combine.



Fig. 18 - Netting has been hauled aboard and fishermen are "drying up" the "heart," October Combine.

The raw material is not weighed. An estimate is made, based on the "pud" (possibly a vestige of the premetric system period), a volume measure equal to 36 pounds. Once the product is packed, the case count is used. Each regional



Fig. 19 - Fish-receiving skiff at "trap," October Combine.



Fig. 20 - Fish (salmon) coming aboard receiving skiff. October Combine.



Fig. 21 - Crew preparing to re-set the "heart" of the trap. October Combine.

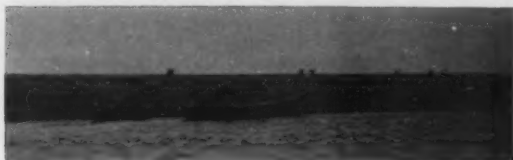


Fig. 22 - Fish barge at river bank near October Combine, Kamchatka.



Fig. 23 - Fish-delivery conveyor to processing plant, October Combine, Kamchatka.



Fig. 24 - Salmon eviscerating machine, October Combine, Kamchatka.

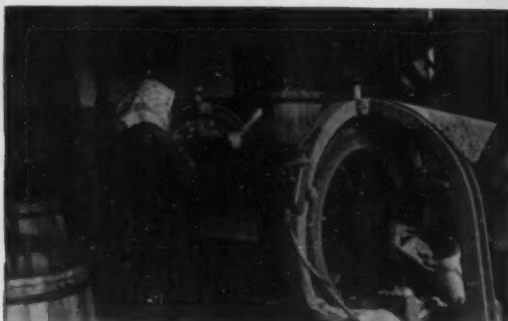


Fig. 25 - Woman worker operating barrel lathe, Ohkotsk Combine.

agency (the People's Economic Council) is responsible for reporting catch and product statistics to the Moscow headquarters. These reports appear in the Russian periodical "Fisheries Industries."

An important part of the Russian salmon-canning operation includes the removal of the roe by hand. Women workers, in "pits" past which the fish are chuted, slit the fish and remove the roe. The fish then go to "iron chinks" for butchering. Hand sliming is used. The fillers seen were Troyer-Fox or Jensen (vintage 1920's) probably installed by United States companies in the early 1930's. Balance of the canning equipment seen was comparable. A large amount of hand labor was evident, even for the slow-speed lines in use. Retort capacity seemed to be the limiting factor for glut processing.

**CANNED FLATFISH IS IMPORTANT PRODUCT:** Flatfish were being processed here, as elsewhere. The season of major production is October through December. This supplements the salmon and herring fisheries very nicely and extends the use of canning equipment. Four flatfish species are used for canning (or for freezing): (1) *Limonda aspera*; (2) *Bilinata*; (3) *Pleuronectes quabrituberculatus*; and (4) *Limonda herzenstein* (Jordah-Snyder). Approximately equal amounts of each of these are taken. Other species (of which we noted several), together with "trash" fish and the trimmings from the canning operation, go to the reduction plant. Alaska pollock is one of the species taken, but it is not considered suitable for canning or freezing.

Approximately 32,500 cases of 1-pound flats of cambala (flatfish) are canned annually at this combine. When a fishing vessel arrives with these species, the fish are pumped from the trawler's hold to shore pens for sorting. The selected species are then washed and the head, tail, fins, and the belly cavity area are sawed off in a hand-saw operation. The waste joins the discarded fish en route to the fish-meal factory. Flatfish from frozen storage may also be used for canning.

**PROCEDURE FOR CANNING FLATFISH:** The trimmed portion is again washed, then cut (by a gang band-saw set-up) to fit the 1-pound flat when packed on edge. Breading is applied by hand. The breaded portions are next put in mesh baskets, immersed in a deep-fat-fryer vat for 3 minutes, then cooled for 1 to 2 hours.

Women next pack the portions into the cans. Spiced tomato sauce is ladled into the cans as they pass along the conveyor en route to the seaming machine. Retorting is standard. The product is quite acceptable to the Russian people, especially since this a relatively inexpensive form of permanently-preserved animal protein.

**FREEZING FLATFISH:** Flatfish are also frozen. The fish are placed two layers deep, by hand, in stainless steel pans about 18" x 30" x 3" high. Blast units maintained at -30° F. are used for fast-freezing. The frozen product is removed from the pans and stacked in frozen storage until shipped or used for canning. No glazing or other protection was observed. The canned flatfish was noted for sale in an inland town at 5 rubles per 1-pound flat, as compared to 11 rubles for 1-pound canned pink salmon (1 ruble equals US\$0.25).

The frozen flatfish and the better-quality mild-salted salmon are boxed for shipment to market. This salmon and the salmon caviar (in kegs of about 60 pounds each) are kept in refrigerated storage until offered for sale. One of the local cold-storage plants had an absorption-type ammonia system. It was considered quite satisfactory, and seemed to be well-designed and maintained. The operator-in-charge was a woman of about 25. Since the combine is chronically short of electric power, but can get, as "fuel" for the absorption system, the waste steam, the system seemed a "natural" for use under these circumstances.

A further canned product was "ragout" from the trimmings of the salmon-canning operation. Sometimes a ground sausage-like product was prepared from salmon trimmings, with seasonings added, then canned.

**SALMON CAVIAR:** The salmon caviar plant was principally notable for the attempt to be very sanitary. We waded through a pan of "antiseptic" solution before entering the screened plant. White smocks were passed out to each visitor. The processing was the standard hand sieving, brining, and oil-coating usual for salmon caviar. Several "qualities" were prepared, apparently based on species, egg size, and maturity. The final product was placed in kegs, each about 60 pounds net capacity, and held in chilled storage until shipped. It was difficult for us to make the Russians understand that United States practices do not include saving of roe for caviar. They consider this the most valuable product of the salmon fishery.

**THERE'S "PROFIT" IN RUSSIA, TOO:** Some semblance of the profit motive was observed in the operation of the combine. The fishermen are paid for the raw material. The combine, using this price as its prime cost, adds the processing cost and "a little for profit" and offers



Fig. 26 - October Combine warehouse where filled and processed salmon cans are being outside-lacquered. Here they emerge from dip tank.



Fig. 27 - United States fisheries delegation studies fish-gear types, October Combine, Kamchatka.



Fig. 28 - Cold storage at October Combine as seen from the river.

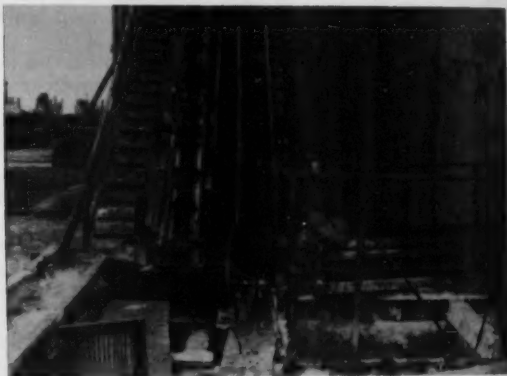


Fig. 29 - Conveyor from raw material pit to grinder in fish-meal plant, October Combine, Kamchatka.



Fig. 30 - Portable coal-fired steam boiler used at October Combine fish-meal plant.

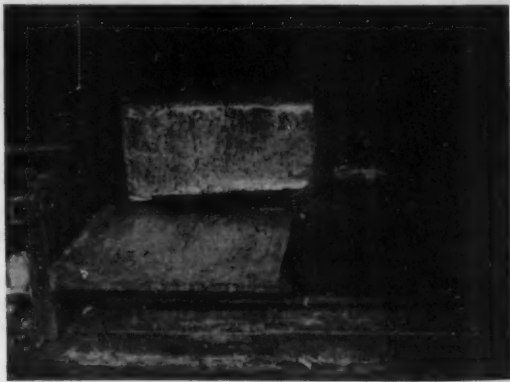


Fig. 31 - Raw material grinder, fish-meal plant, October Combine, Kamchatka.

the product for sale to the State distribution agency. The combine contracts to supply to the transport agency (in this case the refrigerated carrier vessel) a given quality and quantity of products. The carrier, in turn, contracts to pick up and deliver the agreed-upon shipments to railhead storage.

**FISH MEAL FROM OFFAL:** The reduction plant consisted of a coarse grinder for the raw material, small cooker-press unit, two-pass steam-jacketed dryer, vapor-suction equipment attached to the dryer, and grinding and bagging equipment. Capacity of the plant was about 2,000 tons of fish meal per year. Jute bags (100 pounds) were used. Quality of the meal was good. Since only flatfish raw material was used, there was no attempt made at (nor equipment available for) oil recovery. The meal was shipped into the more populous areas for use as poultry or swine feed supplement. Active interest was displayed as to markets for export of Russian fish meal to the United States. It may well be, as the Bering Sea trawl fishery and that along the Pacific Coast of Russia expands, the United States west coast may become a more economic market outlet than that via vessel carrier and railroad transport 3,000 to 5,000 miles to the west into European Russia. There was mention made of the use of urea as a feed



Fig. 32 - Fish waste destined for fish meal plant, October Combine.



Fig. 33 - Fish meal sacking and storage, October Combine.

apparently based on: (1) quality, and (2) distance to market.

supplement in cattle nutrition, showing that knowledge of alternative supplements to animal protein sources is being disseminated.

**SALT FISH PLANT:** The saltery consisted of 16-cubic-meter vats of concrete, recessed into the earth. There were 360 of these vats; estimated capacity, 350 metric tons. Annual production consisted of 200 tons of salmon, 150 tons of herring. For salmon, medium-salted grade, a period of 6 to 7 days for salt-curing was necessary. Hard-salt salmon was processed for 14 days. Half-tierces, boxes, or reed sacks were used for packaging of the salted product,

**VISIT TO THE FISHING VILLAGE AT OZERNAYA:** The evening of August 31, the group went ashore from the Tuloma to the fishing combine at Ozernaya, some distance to the south, but on Kamchatka. Facilities were similar there except that, with a good supply of red salmon, the combine had prospered and had, apparently, put back into the town some of the profits of the fishery. The cannery consisted of two lines of the same style equipment as previously mentioned, including exhaust boxes, but with 4 Japanese replicas of the Smith iron chink and two sliming lines. There were being installed two Japanese "high-speed"  $\frac{1}{2}$ -pound salmon lines. Two Japanese<sup>1/</sup> copies of the Smith chink of newer vintage, said to process 120 fish per minute, were also being installed. The cannery was fairly well laid out for efficient production. The walls were tiled up about 5 feet from the floor, but the concrete floors were very rough and poorly-drained.

The fish were removed from the vessel holds by use of a large centrifugal pump, powered with an automobile engine (including the transmission). A second such engine supplied the tangential jet to "prime" the main pump. Capacity of the system was 30 tons per hour.

<sup>1/</sup> CAN - Tokyo Seikan Kaisha, Ltd.



Flatfish are also canned as the product "cambala," described earlier in this report. Year-round canning of this product is conducted at a daily capacity of 300 cases (1-pound flats).

The large saltery's activities are primarily for processing of herring. Annual production is at a level of 12,000 tons of herring, with an additional 800 tons of line-caught cod. Salted fish are held in  $-7^{\circ}$  to  $-6^{\circ}$  C. ( $19.4^{\circ}$  to  $21.2^{\circ}$  F.) cold-storage space.

Freezing activities are for flatfish, with the principal species utilized those listed elsewhere in this report. Production is at the annual rate of 800 tons of flatfish, plus 1,000 tons of line-caught cod. Temperature in the frozen storage rooms visited was  $-12^{\circ}$  C. ( $10.4^{\circ}$  F.). No glaze was evident on the piles of frozen fish seen.

A new cold-storage building, of pumice block, was under construction. Capacity--for frozen storage only--was 2,000 tons.

**FARM COMBINE COMPLEMENTS FISHING ACTIVITIES:** This fishing combine also has, as an adjunct, a farm combine up the river valley a few miles. The advantages of supplementation of food supplies were evident in the dietary variety as contrasted to other Far Eastern localities visited. Natural grass hay was being cut from large areas of the level land; small herds of beef and milk cows were observed, as well as some swine. Some larger plots of vegetable crops were noted, in addition to the "personal" gardens in the town proper. Potatoes, cabbage, cucumbers, tomatoes, turnips or rutabagas, and onions were among the varieties noted.

This fishing combine had a population of 5,500, of which 3,000 were workers. Also, of the 5,500, about 4,000 were permanent residents; 1,500 were transient workers, largely from Central Asia. A sprinkling of North Koreans was evident here, as elsewhere, in the fishing villages visited.

#### PORT OF NEVELSK, SOUTHERN END OF SAHKALIN ISLAND

Our next stop was Nevelsk, on the West Coast of Sahkalin Island near the south end. We arrived in the roadstead off Nevelsk about 5:00 p.m. on September 7. The usual two tugs, with the principal fisheries officials of the area aboard to welcome us, ferried us ashore by 6:00 p.m. Nevelsk was the first city we had seen since departure from Khabarovsk. We were quartered in the local (trawler) fishing industry hostel, at which vessel crewmen put up during their free time ashore.

We were permitted little opportunity to wander about this town, possibly because of the tight schedule. The town was built along the coast, with a steep hillside only 2 or 3 blocks back from the waterfront. Trawling was the principal activity. We saw possibly 40 trawlers at sea nearby, and another 40 anchored closer inshore, but not fishing. No local fish-processing facilities were visited.

**ANTONOVO RESEARCH LABORATORY:** On September 8 we journeyed, by single-car Diesel-powered rail car, north along the west coast to the Sahkalin Island headquarters and research center of TINRO (Pacific Institute for Oceanographic and Marine Research) in the town called Antonovo. This laboratory is well-staffed, with 42 professional people out of a total complement of 99. Several types of research are conducted there, and at the four substations in the Sahkalin-Kurile Island area assigned to the Antonovo laboratory for supervision by the People's Economic Council. Leionidov, the Director, is also in charge of the technological research work under way.

Among the projects are:

##### (1) Hydrobiology

- (a) Plankton distribution in Tatar Straits, the Northern part of the Japan Sea, and the Southern part of the Ohkotsk Sea.

- (b) Seaweed research, especially on *Laminaria*, *Anfestia plicata*.
- (c) King crab; and other shellfish, including scallops and shrimp.
- (2) Gear studies
  - (a) Improvement in gill nets, purse seines, trawls, fixed nets, and drift nets.
- (3) Technology
  - (a) Problems of salting and canning herring and salmon, and the recovery byproducts from them.
  - (b) Storage and transport of fresh fish. (They had found chilled sea water not much good after 5 days.
  - (c) Uses of seaweed.

**SAHKALIN ISLAND HATCHERY:** Next morning we drove, by auto, along the same route for about one hour, then turned inland to a hatchery installation. The facility was said to have been initially built by the Japanese about 1927. The Russians, since about 1951, had razed the disused facilities and begun a more extensive program. At the time of our visit the annual level of production was said to be about 26 million eggs; ultimate annual capacity sought--33 million. Fish are largely chums, with a few pinks, and some sima (a sixth member of *Oncorhynchus* family found on the Asiatic side of the Pacific). Outstanding accomplishments cited were mortalities down to 1.3 percent since new water-filtering facilities have been installed. They are able to keep chums for five months before releasing them.



Fig. 34 - Living quarters of salmon hatchery workers, Sakhalin Island.

The staff of the hatchery seemed quite capable. Eleven families were in residence. Much of the manpower utilized was young girls in two categories: 3 engineers in charge of the research and production direction; and groups of technicians (younger, less trained girls) assigned to the egg-picking and related manual chores.

#### NAKHODKA, THE PRINCIPAL WINDOW ON THE PACIFIC

The evening of September 9 we returned to the Kuloy and the vessel departed for Nakhodka (the port about 50 miles from Vladivostok), the only Russian Far East port open to foreign vessels. We arrived off Nakhodka about 10:00 a.m. on September 11. By noon we had tied up at a wharf, unloaded our belongings, and been taken to a hostel. After lunch in a nearby restaurant we were taken on an auto tour of the docks and warehouses and then to the principal points of interest around the town.

**HARBOR AND WHARF FACILITIES:** Nakhodka is only 10 years old. It has an excellent well-protected harbor, with inner bays available as anchorages. Ocean-going freighters and tankers were moored at the wharf on which were many railroad cranes for swinging cargo from ship to shore and vice versa. Several rail sidings paralleled the wharf front. Next to these were 3-, 4-, and 5-story warehouses, including dry stores and cold-storage installations. The cold storage shown us was modern and reasonably well-operated, except for the lack of packaging or other forms of protection for the many frozen products in storage. Hand labor was evident at all stages.

Nearby we were shown through a multistory warehouse building in which canned fish was stored. Samples of several species and products were opened for an impromptu taste-panel by the group of Russian and United States fishery experts. Some salmon, labeled in English, was said to be for Western European trade. Interest was expressed in the possibility of an export market for salmon in the United States.

**TOUR OF PUBLIC BUILDINGS:** Our tour next included a drive past various schools, public buildings, and residential areas (largely the garden-court type of apartments). Because of the rugged terrain, any building or road construction was difficult and expensive. Hills of solid rock must be cut down; the narrow, winding valleys filled. Nevertheless there was considerable construction activity for miles along the row of hills just back from the narrow strip of level land along the waterfront.

We were shown the entire inside of one of several houses of culture. This structure had been completed not over two years ago at a cost of about 1 million rubles (US\$250,000). It had a rather large well-equipped stage and seating capacity for possibly 1,000 people. A regular schedule of events is developed each year by the director, including orchestras, ballet, singers, lectures, etc. Other parts of the 3-story building were used for such purposes as: reading and reference library (adults and children), game rooms, child guidance and group activities, and meeting rooms for local people.

We also drove through areas of new apartment development and of individual residences further away from the downtown area. As everywhere we travelled in Russia, the principal problem was lack of any semblance of good roads, or even streets, except on main thoroughfares in the larger cities.

Highlight of our visit to Nakhodka was a dinner on September 11. After about 3 weeks in fishing villages and aboard ship we marveled at a well-decorated, spacious restaurant, complete with a 5-piece orchestra playing an excellent variety of dinner music. The food was of a quality to reflect credit on the management.

**TRAIN TRIP TO Khabarovsk:** Our departure from Nakhodka, originally scheduled for early on the morning of September 12, was delayed by flood damage along the route of the spur from Vladivostok resulting from the heavy rains of a few days earlier. We went aboard first-class coaches of the Trans-Siberian train at 11:00 a.m. Facilities were comparable to our Pullman compartments. There were two lower and two upper berths athwartships, with a small work table near the window. As we had only two persons per compartment, it was quite a comfortable trip.

The country through which we passed was apparently quite fertile, wooded where wild, and sparsely populated. We were told that certain parts had been set aside as sanctuaries for the Siberian tiger. Wild boar were also reportedly present. Habitations were almost exclusively restricted to sporadic farm villages along the railroad. Some coal-mining activity was evident, especially on the southern end of the trip. Where the soil was in use, and judging from areas of natural hay, the area would be a productive one for agricultural support of Far Eastern needs; this is not to compare it with "the Virgin Lands," or the Ukraine, thousands of miles to the westward.

As we approached Khabarovsk, the towns were larger. Groups, transported from the towns, were observed harvesting crops (largely potatoes) from large fields, apparently as part of a State farm operation. Industrial support activities, observed in the environs, were principally impressive for the vast coal piles seen along sidings. Chemical, furniture, and other wood-working plants, and coal-powered electricity-generator plants, were among those noted.

**Khabarovsk, Metropolis of the Far East:** We arrived at Khabarovsk at 1:00 p.m. on September 13. Brief talks were held with the local TINRO officials regarding all our observations of Far East activities. Plans were agreed upon for the next day. Our hosts then treated us to the finals of the intercity "football" (soccer) league of the area. The newly-



completed stadium, on filled land along the bank of the Amur River, was impressive. Nearby a pavillion was being constructed. The crowd was enthusiastic; the soccer contest close. All, including the United States fisheries delegation, had a pleasant outing.

**KHABAROVSK MANAGEMENT AND RESEARCH CENTERS:** The next morning we went first to the headquarters of the suburban enforcement division of TINRO. In the afternoon we moved downtown to the TINRO headquarters for further discussions. The office operates as a branch of TINRO, with main headquarters at Vladivostok, under Dr. Panin. It is one of four such stations in the area. Total local professional personnel was 40, of which 34 had advanced degrees. There are three principal programs of research under way:

1. Salmon, including study of stocks, propagation, and hatchery production expansion.
2. Fresh-water fish biology; study of the resource and the stock.
3. Artificial pond culture for fresh-water fish.

We left Khabarovsk the morning of September 15 in a TU-104 jet and reached Moscow that evening.

#### MOSCOW RESEARCH CENTERS

In Moscow we conferred with the principals at the VNIRO (All-Union Institute for Oceanographic and Marine Research) headquarters about our trip, items of interest which we wished to follow up, and to discuss background on United States fishery activities of interest to that Institute's staff. My primary interest was in the technological, statistical, and economics areas. In addition to these general (group) discussions, sessions were held on September 16 and 17 with the appropriate staff specialists in these fields. A map was supplied us showing the VNIRO, TINRO, National Academy of Science, and University locations where fisheries (or related subjects) research is in progress. (See map p. 14.)

The total VNIRO staff at the Moscow headquarters now totals 2,500--about half scientists and half technicians; there are 200 Ph.D's. The areas of work include both theoretical and practical research. Projects are planned at the Institute, based on industry needs observed at the field level. Local (field) People's Economic Councils recommend the areas needing research. At present the finances, for approved programs, are supplied by the State. It is expected, soon, that the local units will supply part of the funds.

The statistical responsibilities are vested in the State Statistical Control Agency in Moscow. This group has all aspects of the economy as its responsibility, with the fishing industry a small part of the whole. There seem to be no standardized indices; for example, all flatfish are grouped, as are all salmon. Each combine sends information on daily catch to the Regional People's Economic Council head and to the Central Statistical Agency in Moscow. Other local groups, e.g., cooperatives, must also report, but they are a small part of the industry. The People's Economic Council reports on catch, manpower, vessels, gear, etc., but the detail, or accuracy, is not what the scientific personnel would like for research purposes.

Some concept of the pattern of the industry was obtained. It may be highly inaccurate and incomplete, but is set down as presented to us.

#### BIRD'S EYE VIEW OF RUSSIAN INDUSTRY AND CONSUMER PREFERENCES

Two systems are in use at the fishermen's level:

- |  |   |
|--|---|
| <ol style="list-style-type: none"><li>1. Co-op groups sell catch to processors, based on a contract price.</li></ol> | <ol style="list-style-type: none"><li>2. State fishermen work on a salary basis and their catch goes to the processors.</li></ol> |
|--|---|



Once the fish is processed, the State processor offers it to the State trade organization for distribution to the State market centers. State-operated stores are the ultimate outlets for all the products. At each stage in this process, to the prime cost is added the handling or processing cost and "a little profit" in arriving at the asking price for the next stage. However, the final or retail price is said to have been fixed (and at a fairly constant figure in recent years) by the State. In time, as efficiency builds up, the fixed price is supposed to decline.

There are regional differences in price; these include three zones, based on distance from the source--Far East, Moscow, and remote areas. Most of the mild-cured salmon and herring is shipped to local centers where it may be smoked before sale. At nearer points frozen fish is used for smoking, or for sale.

Preference of the population, as told to us, was salt fish, canned fish, and frozen fish, in that order. Among the less-expensive and widely used products was "cambala"--breaded flatfish, fried, and canned in tomato sauce. Some preference was evident for fresh flatfish in areas to which it is accessible. Estimates of market patterns were:

60 percent of flatfish, frozen (part for later smoking)  
30 percent of flatfish, canned (cambala)  
10 percent of flatfish, fresh

Flatfish is mostly sold round, not filleted.

Herring is now, and was predicted to be, continually, a salted item of ready acceptance. Canned salmon is only recently becoming a more significant domestic item, perhaps as the standard of living is raised. Salt salmon is still dominant.

Over the long pull, we were advised, especially in Moscow, that fresh and frozen (and even packaged fish) was expected to gradually replace salt fish on the domestic market. Meanwhile interest was expressed in possible export opportunities for canned salmon, frozen flatfish, and fish meal.

#### OTHER ACTIVITIES IN MOSCOW

Among the other activities of note in Moscow was attendance at the evening performances of the ballet in the Bolshoi Theatre, and of the Russian Circus. Each was without peer, in my experience. We also visited the all-Russian Art Gallery, the Kremlin, and the GUM-State Department Store. Russian ideas of service to customers leave a lot to be desired, even by standards in the United States during the Christmas rush.

Our activities on September 19 consisted of a close-out session at the offices of the State Scientific Committee--our sponsor during the tour. The atmosphere of scientific interest--exhibited during the discussions with the Committee on our outbound visit--was maintained on this occasion. We got the impression that both sides considered such an exchange helpful and worth the considerable effort required to bring it about. I consider our trip constituted a most far-reaching and significant attempt of the U.S.S.R. to show full accord for furthering exchange of scientific personnel in the interest of joint benefit.

On the evening of September 20 we departed Moscow via Air France. Seldom in our experience were the simple comforts of the West so starkly evident as on this flight after so many days within the "Iron Curtain."



## DOWN WITH REJECTS--UP WITH PROFITS

R. T. Whiteleather\*

What is the U. S. Department of the Interior (USDI) Fishery Products Inspection Service and what does it mean to producers and processors? This is a voluntary inspection service which was founded to help the fishing industry and at the same time give the consumer high-quality fishery products. It is not a policing action! It is a program of assistance in quality control. Where defects in production processes are found, USDI inspectors try to assist by recommending corrective measures. Plant management voluntarily defrays the entire cost of the service. Only four years old, this program is still in the growing stage. Its early growth has been extremely gratifying because it demonstrates the confidence that the industry has placed in the Voluntary Federal Inspection Program. You may be a little surprised to know that the amount of frozen fishery products under USDI inspection in the United States is running well over 100 million pounds annually.

In the Gulf and South Atlantic Region specifically, about 47 million pounds of that 100 million pounds plus total are now made up of shrimp products carrying the USDI Inspection Shield. This includes nearly 80 percent of the breaded shrimp output in that area. Considering that breaded shrimp standards have been in effect barely two years, the quantity of shrimp now under inspection has reached an impressive record in volume. The number of shrimp-processing plants subscribing to the Inspection Service has also grown to 18.

All of this might well be called the shiny side of the inspection coin. Now let us turn it over and look at the other side which is a little less bright. Here, we find statistics on the amount of shrimp that has been thrown out of grade or rejected by USDI inspectors for various reasons. Some significant factors or trends have been revealed by an analysis of the weekly records on products rejected by USDI inspectors for the 12 months preceding June 1960. Remedial action would put some additional money into industry pocketbooks. Under today's competitive marketing conditions, everyone will no doubt endorse this idea.

To be exact, 379,112 pounds of shrimp and shrimp products were rejected or thrown out of grade during the 12 months (May 1959-April 1960) reviewed. Percentage-wise, this is not a large proportion of the total production; just about 1 percent. Dollar-wise, however, it could be a substantial amount, depending entirely on the method of disposal of the rejects.

\*Assistant Regional Director, Region 2, U. S. Bureau of Commercial Fisheries, St. Petersburg Beach, Fla.

Note: Adapted from an address at the Shrimp Association of the Americas Annual Convention, Mexico City, June 25, 1960.

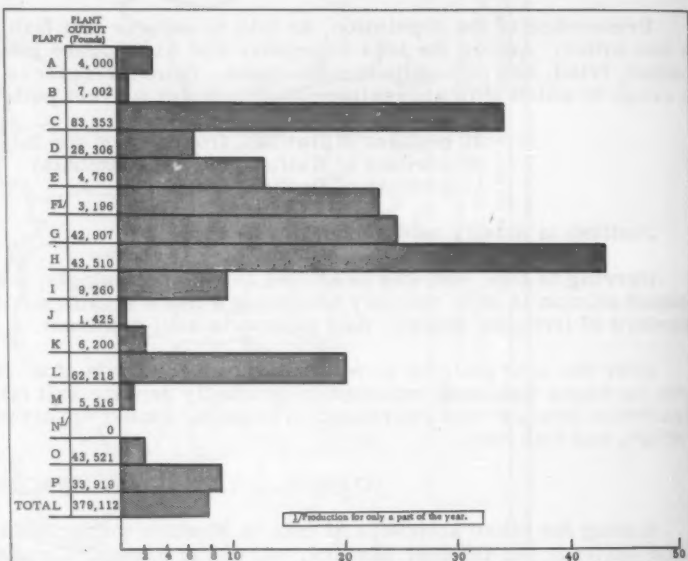


Fig. 1 - Rejection of shrimp at each plant under USDI inspection, Gulf and South Atlantic, May 1959-April 1960.

U. S. DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
SEP. NO. 606

The actual amount of loss in dollars becomes a little cloudy at this point since a product rejected or denied a grade shield is not a total loss if sold out of grade. Products merely out of grade because of certain defects are often sold at lower prices. On the other hand, some rejects reached a condition beyond salability and, undoubtedly, were or should have been discarded entirely. We have no way of pinpointing the exact dollar values involved. However, it is safe to say that if all products intended for Grade A remained in grade, their value would be substantially higher than if sold at a lower grade because of rejection at the time of processing or packing.

In order to analyze the figures, the various reasons for rejection of products were broken down into these six categories:

1. Decomposition
2. Dehydration and deterioration
3. Low net weight
4. Excessive breading
5. Overloaded freezer or defrosting
6. Sanitation

Decomposition for inspection purposes is defined as spoiled or unfit for food purposes. Dehydration is a condition of severe loss of moisture through mishandling. Deterioration is loss of quality, however, the product is well above the decomposition level and still suitable for human consumption. Low net weight means exactly that. Excessive breading is the term

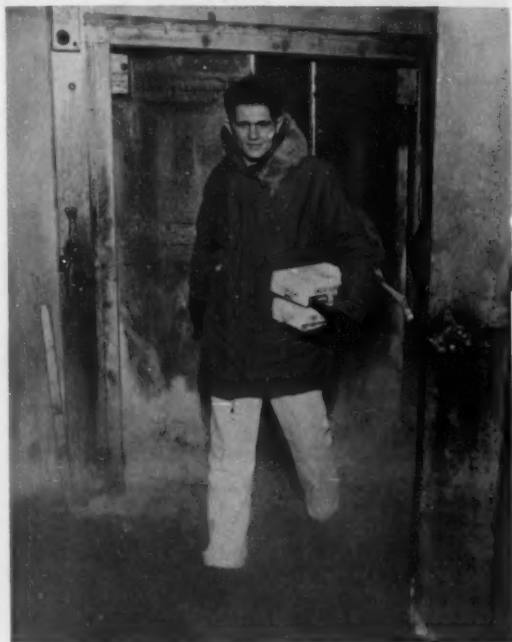


Fig. 2 - An integral part of a USDI inspector's duties--the drawing of official samples and checking blast-room temperatures.



Fig. 3 - USDI inspector examining contents of package to determine condition of breading, excessive frost, and loose breading within package.

used where breading is in excess of 50 percent, including the 5 percent correction factor as permitted under the standards. Overloaded freezer means slow-freezing rate resulting in a poor-quality frozen product, and grouped with this is defrosting, a thawed-out product. Sanitation reflects the sanitary conditions of the product.

A further separation was made to show rejections by types, namely raw headless shrimp, peeled and deveined shrimp, and breaded shrimp.



The preponderance of the total pounds rejected stems from decomposition. Of the total of 379,112 pounds of processed shrimp rejected, 265,600 pounds were rejected because of decomposition. The rejections were mainly at the point of entry at the plant and show definitely that management had not been sufficiently cautious in purchasing shrimp for further processing. Perhaps some of this laxity can be attributed to the realization that raw products not up to quality can be resold or shunted off elsewhere. From any angle that you look at it, this is not a desirable practice and the frozen raw headless shrimp standards will furnish a device for correcting some of this situation. Under the new frozen standards, plant management will be able to buy domestically on U. S. Grade Standards or specify equivalents on foreign purchases. Compliance should reduce the reject figure materially and, at the same time, give management greater peace of mind about the quality of the materials entering the processing plants.



Fig. 4 - USDI inspector weighing debreaded shrimp to determine percentage of shrimp.



Fig. 5 - USDI inspector checking batter temperature to minimize bacterial growth.

Because of dehydration and deterioration, 79,022 pounds, representing 21 percent of the total were rejected. These two factors develop principally because of mishandling either at the boat level, in transporting, or during storage in the plant. Inspectors have constantly worked with management in recommending ways of reducing this figure. There are indications that the trend is moving downward, and the figures on these rejections should be substantially lower in the future.

Rejection for low net weight was very small--850 pounds. The important point here is that an inspector called attention to a faulty scale and incorrect weighing operation before much damage had been done. Alertness of the inspectors in instances such as this often saves management money. Short-weight charges are serious and costly.

Excessive breading caused 21,900 pounds of the finished product to be thrown out of grade. This represents 6 percent of the total processed shrimp rejects. While many plants run close to the maximum breading tolerance, some play the breading percentage too closely

with resulting rejections for this reason. Inspectors keep a rather close check on breeding percentages during plant operations, and the inspector always intends to be helpful when advising management that the percentage of breeding is approaching the limit. In other words, he wants to see correction instead of rejection.

Some of the finished product goes out of grade because of freezer inadequacies--7,740 pounds, or 2 percent, were rejected because of overloaded freezer or defrosting. An overload in the freezer causes slow and improper freezing resulting in defects and a poor final product. Obviously, defrosting is damaging and, unless there is emergency, such as a freezer breakdown, most other factors can be controlled by proper handling and storing. Inspectors attempt to make suggestions for better techniques in this respect wherever improvements are indicated.

Finally, under sanitation there is only a single instance of rejection--4,000 pounds, or 1 percent. This is an isolated and rare case where insects had found their way into the breeding material. The product, of course, was completely unacceptable.

You might wonder if there is any pattern of distribution in the volume of rejects among shrimp-processing plants or if they are spread rather evenly throughout all plants under inspection. Figure 1 shows the percentage of rejects for the year as related to the individual output of 16 plants identified by code letters. It is readily apparent that the heavy burden of rejection falls on about five plants. The others seem to be consistently more observant of the requirements in meeting grade standards.

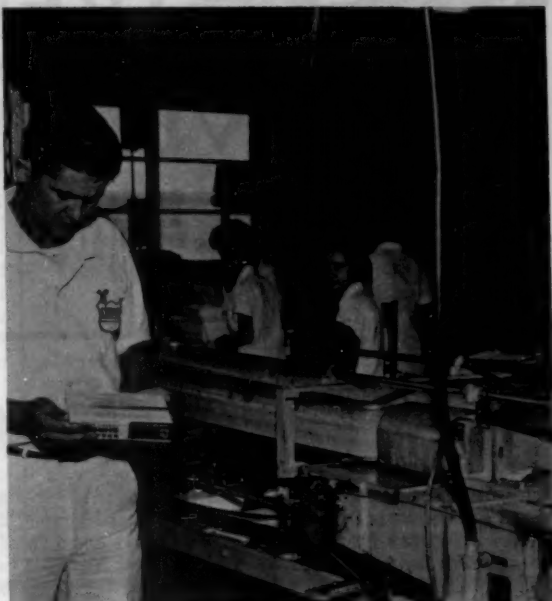


Fig. 6 - USDI inspector examining package coding for the purpose of identification.



#### THE FROZEN FOOD CODE AND THE RETAILER

The growth of the frozen food business will only continue if product quality and value are maintained. It is generally recognized that an extremely high percentage of frozen foods are of excellent quality when packed, but sufficient complaints from consumers are causing concern to the trade. The retailer is largely to blame; the greatest amount of abuse occurs at the retail level. In 1958 of 7,000 retail display cases checked, 30 percent were operating at temperatures above 5°F., 5 percent were from 16° to 25°F., and less than half had the desirable temperatures of 0°F. or lower.

The Frozen Food Retailers Code is in three main sections; definitions, equipment, and handling practices--each section has subsections. The code is comprehensive and covers all aspects from specifying a product temperature of 0°F. to the siting of the show case units, and the provision of backroom storage. In all, some 35 definitions and rules make up this code of practice. ("What the Retailer Must Know About the Frozen Food Code," article, Quick Frozen Foods, Oct. 1959, pp. 186-188.)

# TRENDS AND DEVELOPMENTS

## Fishing Vessel and Gear Developments

### EQUIPMENT NOTE NO. 6--CHAIN BRIDLES AND ACCUMULATORS INCREASE EFFECTIVENESS OF "FALL RIVER" CLAM DREDGES IN DEEP WATER:

Exploratory fishing by State and Federal research agencies and members of the commercial fishing industry revealed the presence of hard clams (*Venus* sp.) in offshore waters of North Carolina. Several types of mechanical and hydraulic dredges have been used in the past ten years in attempts to produce commercial quantities of the clams, but these attempts have been unsuccessful owing to adverse sea conditions, deep water, and extremely soft mud bottom.



Fig. 1 - Commercial catch ( $6\frac{1}{2}$  bushels) of hard clams (*Venus* sp.) taken by the *Silver Bay* off Beaufort, N. C., in 6 fathoms. The chain bridle and the accumulator can be seen.

In the fall of 1959, the U. S. Bureau of Commercial Fisheries' chartered exploratory fishing vessel *Silver Bay* was assigned

to part-time clam-dredging operations off the North Carolina coast with a 14-tooth "Fall River" dredge. Initial results were comparable to those obtained by previous investigators in the area. Through experimentation it was determined that the main cause of the poor catches lay in the inherent design and action of the dredge:

1. Efficient dredge operation could only be accomplished with an extremely small ratio of towing-warp length to water depth (warp-scope ratio), because increasing the ratio served only to tip the dredge forward, thereby reducing its catching efficiency (fig. 2, A and B). Efficient operation in deep water, where a large warp-scope ratio is necessary, was therefore precluded.

2. Even with a small warp-scope ratio, the dredge tended to skip or bounce over the surface of the sea bottom in rough seas, on uneven bottom, or when the vessel speed was excessive.

A series of gear studies, undertaken to correct the observed shortcomings of the dredge in deep-water operations, resulted in the adoption of the following modifications (fig. 2C) which increased the catch efficiency of the dredge:

1. The tow point was lowered from the original fixed position on the bail to change the angle of attack and to allow greater control over the angle of attack. This was accomplished by connecting two 9-foot chain slings to the bottom of the vertical steel stiffeners. The chains were shackled together at their forward ends to form a bridle. A third chain was run from the bail to the apex of the chain bridle for controlling the angle of attack. By lengthening or shortening this control chain, the dredge can be made to assume the angle of attack desired for any warp-scope ratio, including the large ratio needed for deep-water work. Determination

U. S. DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
SEP. NO. 607



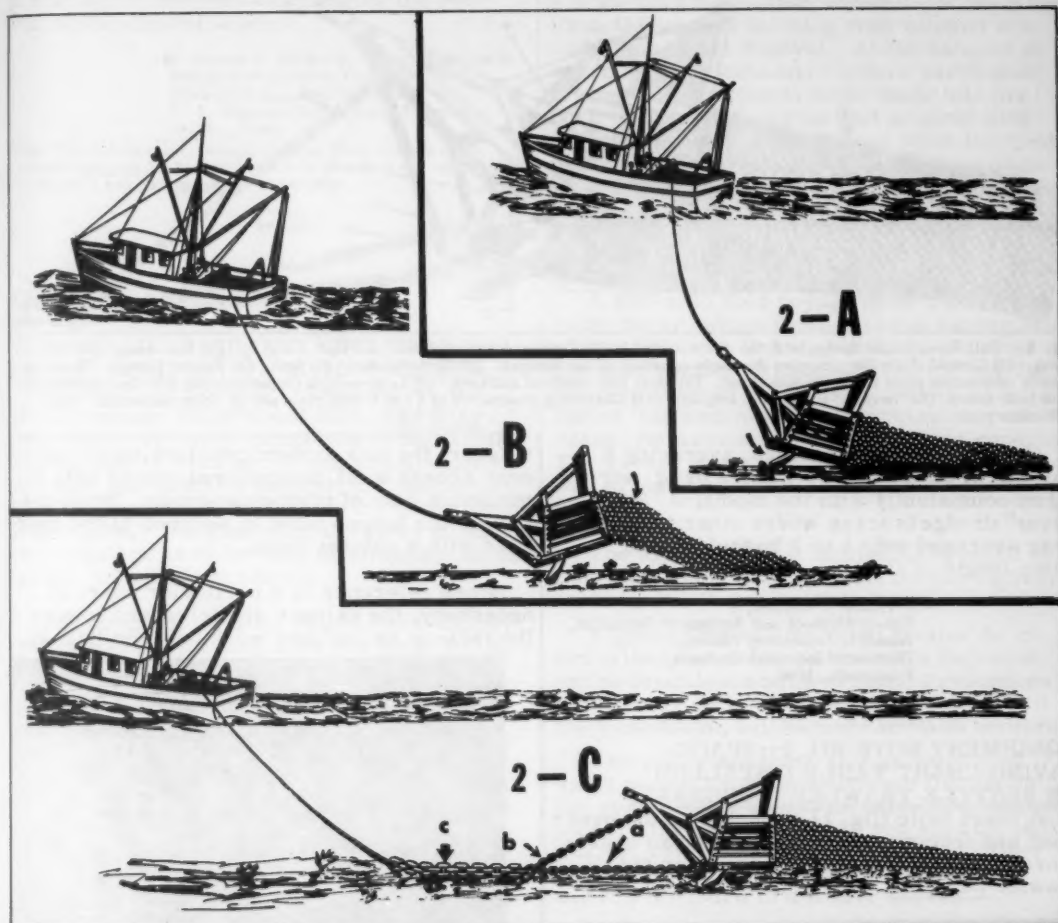


Fig. 2 - Dredge position in relation to the warp-scope ratio: **A.** Even with a short scope, efficient operation is often precluded because excessive ground speed or sudden surges from wave action cause the gear to skip out of the bottom. **B.** When the warp-scope ratio is increased, the dredge tips forward. Catching efficiency is thus impaired because of the reduced penetration of the teeth into the bottom. **C.** Gear modified by the addition of chain bridles (a), control chain (b), and accumulator chain (c) rides at the apparent optimum angle of attack.

of the desired angle of attack was accomplished by correlating the catch with observations of the condition of the runners and teeth of the dredge after each drag. Optimum efficiency is apparently attained when the dredge is on the bottom the full length of the runners.

2. To reduce the tendency of the dredge to skip out of the bottom, nylon towing warp was used in the place of wire, and catches greater than those obtained using wire warp resulted--especially in rough seas or when

working uneven bottom. The advantage obtained, however, was offset by the greater risk to the deck crew, excessive manpower requirements, and a more time-consuming operation.

3. A 5-fathom length of  $\frac{3}{4}$ -inch-diameter chain was then attached between the end of the tow warp and the chain bridle of the dredge to act as an accumulator. This markedly reduced the skipping action of the dredge, thereby permitting a return to wire warp and resulting in a safer, more efficient operation.

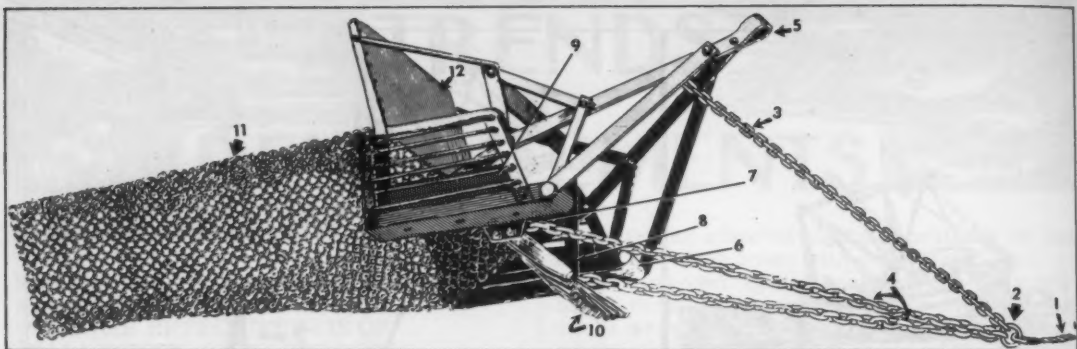


Fig. 3 - "Fall River" clam dredge with the chain towing bridle (accumulator not shown--see figs. 1 and 2): (1) Tow warp. (2) Tow ring. (3) Control chain (for changing the angle of attack of the dredge). (4) Chain bridles. (5) Bail. (6) Runner (shoe). (7) Chain bridle connection point (same on both sides). (8) Steel bar--vertical stiffener. (9) Lead weights (approximately 200 lbs. distributed on both sides). (10) Teeth (7-9 inches in length). (11) Chain bag constructed of  $\frac{1}{4}$ -by 2-inch rings and  $\frac{5}{16}$ -inch connectors. (12) Pressure plate.

Commercial-size catches, averaging 6 bushels of clams per 30-minute drag, were taken consistently with the modified "Fall River" dredge in areas where other types of gear averaged only 1 to 2 bushels in the same length of time.

--By Francis J. Captiva,  
Fishery Methods and Equipment Specialist,  
Branch of Exploratory Fishing,  
Division of Industrial Research,  
Pascagoula, Miss.

\* \* \* \* \*

#### EQUIPMENT NOTE NO. 7--SPACE- SAVING CHART TABLE INSTALLED ON SEATTLE TRAWLER "SUNBEAM":

A chart table (fig. 1), mounted on the overhead and featuring electrically-driven chart-storage spools, has been installed on the trawler Sunbeam. Designed by the vessel's

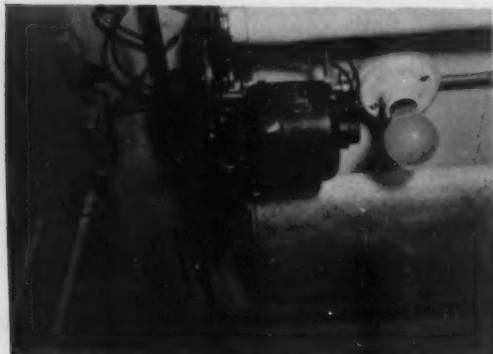


Fig. 1 - Drive motor and storage spools on lower side of the chart table. The chart table is here shown as fixed to the ceiling of the cabin.

skipper, the new system provides quick and easy access to 25 navigational charts with a minimum loss of pilothouse space. When not in use, the hinged table is secured to the overhead with a cabinet latch.

When reference to a particular chart is necessary, the skipper unlatches and lowers the table to an inclined work position (fig. 2).



Fig. 2 - Use of chart table in an inclined work position.

As the table moves down from the overhead, a chart lamp is automatically turned on. To move the needed chart into position, a control lever, located under the lower edge of the table, is operated. This turns on the motor and engages a 2-way friction drive, causing charts to unroll from one spool and wind up on the other. Individual charts, fastened to one another with cellulose tape, move across the top of the chart table at a steady

pace of about 6 inches a second. Direction of rolling is reversed by changing the position of the control lever.

--By Richard L. McNeely, Electronic Scientist,  
Branch of Exploratory Fishing,  
Division of Industrial Research,  
U. S. Bureau of Commercial Fisheries,  
Seattle, Wash.

Note: Appreciation is expressed to Capt. Ward Nickols of the trawler *Sunbeam* for his cooperation in providing the opportunity to describe and photograph the chart table.



## Alaska

### NEW FILM ILLUSTRATES KING CRAB FISHING INDUSTRY OF KODIAK REGION:

National distribution is assured for the new 30-minute color sound film, *The King Crab Story*, recently completed by the Alaska Department of Fish and Game in collaboration with the Kodiak Chamber of Commerce and the king crab fishing industry of the Kodiak region. The film tells the story of the king crab and is to be used to stimulate sales for the industry's products.

The theme of the film emphasizes the contribution the giant king crab has made to the Kodiak Island area. A very few years back the Island's fishing potential was limited to a few months of summer fishing for salmon and halibut. Now the king crab industry goes into full swing around September each year and prospers through the winter providing work for many fishermen and the workers in processing plants. A half dozen processing plants operate on the Island for 8 months of the year.

The film begins with historical references to Kodiak as Alaska's oldest community. The town was established when George Washington was President. A biological sequence shows the work being done by a Departmental research biologist in a program designed to keep the industry functioning on a sustained yield basis. For the first time a king crab shedding its shell is recorded on film.

Other scenes depict the fishing fleet during winter gales and processing plant operations showing how the king crab is prepared for market.

The grand finale of the film is devoted to the annual King Crab Festival staged by the citizens of Kodiak during the month of May.

King crab burgers, skin diving for crabs, a crab-shaking contest, crowning of the King Crab Queen, and the king crab banquet are highlights of the festival. At the banquet in which all residents and visitors participate, prizes are awarded to local chefs who produce the most delectable and original king crab dishes. The final scenes show the fleet departing for the king crab fishing grounds.

\* \* \* \* \*

### SURVEY OF SUBSISTENCE FISHING MADE ON KUSKOKWIM RIVER:

A 485-mile boat voyage down the Kuskokwim River, which flows into the Bering Sea north of Bristol Bay, to obtain an estimate of the total number of salmon used for dog food and personal use by Alaskan natives was completed this summer, the Commissioner of the Alaska Department of Fish and Game reported. The voyage was made by skiff by members of the Arctic Commercial Fisheries Division staff.

The voyage began at McGrath and ended at Napakiak, about 50 miles from the Bering Sea, visiting all villages and fish camps en route.

Figures obtained provided a valuable index to the Kuskokwim catch and the degree of native dependence on these fishery resources. The survey, which is the first of its kind on the Kuskokwim, will be made annually hereafter.

The biologists found that an estimated 2,132 persons were subsistence fishing on the river. They caught an estimated total of 19,457 king salmon, 70,580 red salmon, and 266,487 chum salmon. Pink salmon, silver salmon, sheefish, whitefish, and smelt figured in the catch to a lesser degree.

The largest number of persons fishing and the largest catches of all species of salmon, except chums, came from the Bethel area between Napakiak and Kwethluk. The greatest chum salmon catch was from the Aniak-Little Russian Mission area.

Much useful information was collected during the trip on the timing of runs and the spawning areas of the various species.

The District Management Biologist, Anchorage, who heads the Arctic area projects said surveys of this kind will provide much needed data on fluctuations in the salmon runs on the Kuskokwim River.



## Antarctica

### WORM PARASITES OF POLAR FISHES TO BE STUDIED:

A new 30-foot, double-planked research cruiser, specifically designed and built for use in exploring the chilly waters of Antarctica, was loaded on the United States cargo ship Pioneer Isle at Newport News, Va., in mid-October 1960.

W. Stanley Wilson, special staff member of the Virginia Fisheries Laboratory, Gloucester Point, will use the vessel during the next 12 months at Wilkes Station on the fringe of that ice-covered continent around the South Pole. To withstand the grueling conditions of this bleak continent, the Octans (named for a constellation directly above the South Pole) was especially designed and constructed at a cost of over \$21,000, including enough spare parts for a year's operation.

The hull is double-planked and reinforced against ice with a quarter-inch steel prow and 1/8" stainless steel sheathing at the waterline. Although it is only 30 feet long, the craft weighs about six tons. A special heating unit will preheat the gasoline marine engine so that the boat may be operated at subzero temperatures, which are common in that part of the world.

Although Wilkes Station is cold when compared to winters in Virginia, it is ice free about seven months of the year. For the other five months the water freezes up to two feet thick, but breaks up periodically under the impact of winds which sometimes gust up to 100 miles per hour.

This open water is the reason for going to Wilkes rather than returning to McMurdo, where previous fishery explorations were conducted. In McMurdo it was necessary to cut through six feet of ice in order to set the traps and it was impossible to do any seining. At Wilkes base it will be possible to operate a trawl net, haul seines, and a variety of other fishing gear. Even during the five winter months it will be possible to collect some material during the period when the ice is broken up by the winds.

The Octans is equipped with a ship-to-shore telephone and will at all times tow a 14-foot aluminum boat with an outboard 18 hp. motor. Both boats can be used together for hauling seines, and the small boat will

serve as a lifeboat if necessary. There is a four-man rubber raft aboard, hand flares, and a flare pistol with several hundred rounds of ammunition.

The boat contains berths for two, an auxiliary generator, an alcohol stove, three bilge pumps (one automatic electric, another mechanical, and a third hand-operated), a depth-recorder (fathometer) which records depths up to 1,200 feet.

A special keel cooling system circulates antifreeze through the marine motor. A special guard around the propeller protects it from ice damage, and a power winch on deck will operate trawls, dredges, bottom grabs, and bottom corers. Deck lights are arranged for working at night, which will last 24 hours during the winter months.

One of the problems which will be faced is the freezing up of the nets as they are landed on deck. At such low temperatures the nets become stiff and unpliable almost as fast as they are taken out of the water.

Wilson will leave Gloucester Point to go South in early November, and expects to arrive at Wilkes base in mid-January 1961, which will be early summer in that part of the world. Only one ship a year brings supplies to the 23 people who operate that station. Besides Wilson, who is the only biologist in the group, there will be meteorologists and glaciologists. Wilson will remain there for the calendar year.

This expedition to Antarctica is financed by the National Science Foundation to enable Dr. William J. Hargis, Jr., Director of the Virginia Fisheries Laboratory, Gloucester Point, to study the worm parasites of these polar fishes. Hargis is sending Wilson to the Antarctic, Australia, New Zealand, and possibly Madagascar to collect fish parasites and parasites from birds and mammals in these far-flung regions to determine the world-wide distribution of various species.

In addition to collections of fishes, Wilson will collect many invertebrate animals, including crinoids, starfish, crabs, and mollusks. These will be distributed to the Smithsonian Institution and other leading museums in the United States.





## California

### RECOVERIES OF KING SALMON MARKED IN 1959 TO DETERMINE MIGRATION HAZARDS:

The first marked king salmon released in a California Department of Fish and Game experiment early in 1959 were recovered this year, that Department announced on October 21, 1960.

Young king salmon were released in four lots of 250,000 fish each at Chico, Rio Vista, and San Francisco Bay to determine the effect of downstream migration hazards.

Two lots were released in the Bay; one was trucked to Tiburon from the U. S. Fish and Wildlife Service's Coleman Hatchery, and another lot was trucked to Rio Vista, where the fish were transferred to a live-bait boat and delivered to the release site.

As of the fall of 1960, the marked fish were two years old, weighed 6 to 8 pounds, and were 20 to 26 inches long. Few of the fish were large enough (26 inches) for the commercial catch, but one commercially-caught salmon released at Rio Vista was recovered. In the ocean sport fishery, more were large enough (22 inches) to be landed. Six boated fish and one Rio Vista fish were recovered. In the Sacramento River, two Rio Vista and two Chico kings were caught.

Fish arriving at Coleman Hatchery during the first two weeks of the spawning season included 14 boated fish, 11 from the Rio Vista release, 9 from the Chico release, and 4 fish trucked to Tiburon.

These results are preliminary, but show that fish survived all types of releases and should be available as 3- and 4-year olds in sufficient numbers to make a valid comparison as to what part of the migration to the sea is most hazardous.

\*\*\*\*\*

### TRAWLING GEAR TESTED ON DUNGENESS CRABS:

M/V "Nautilus" Cruise 60N5-Crab: An experiment with crabtrawling gear was conducted (June 25-July 10, 1960), by the California Department of Fish and Game research vessel *Nautilus* in Bodega Bay, Calif., to develop techniques for catching crabs. Other objectives of the survey were to initiate a standard procedure for random sampling of the fishing grounds; to obtain crab measurements for age and growth studies; and to determine crab shell condition (hard/soft) for life history studies.

A semi-balloon-type otter trawl of three-inch webbing was used in an attempt to catch quantities of Dungeness crabs, *Cancer magister*. Three daylight drags caught 13 crabs and three night drags yielded 7. Each drag covered approximately one linear mile of the bottom in a  $\frac{1}{2}$ -hour period.

To determine the effectiveness of traps as compared to trawling, two strings of 18 40-inch traps, without escape ports, were placed in two locations at the sites of four drags. Each set covered about  $\frac{1}{2}$  linear mile and was fished for a maximum of 24 hours. Since 169 crabs were taken by traps and less than 15 by net, it was decided to use traps for sampling.

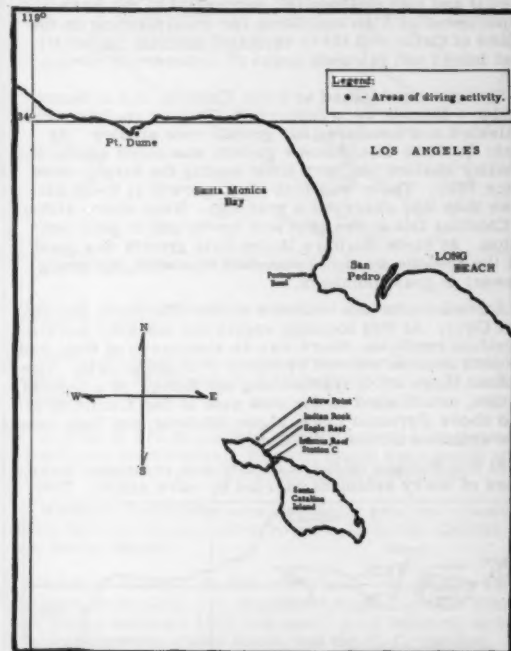
Age and growth data were obtained from trapped crabs. In all, five strings of 18 traps were set.

\*\*\*\*\*

### INVESTIGATION OF ABALONE RESOURCES CONTINUED:

M/V "Nautilus" and Diving Boat "Mollusk" Cruise 60N7, 60M2-Abalone: Abalone investigations were continued from July 22-31, 1960, by the California Department of Fish and Game research vessel *Nautilus* and diving boat *Mollusk* in waters off Portuguese Bend, Pt. Dume, and Catalina Island. The objectives were (1) to make observations at abalone stations established in 1959; (2) to check other areas for commercial diving activities; (3) to check areas of skin diving; and (4) to collect and photograph in color various species of abalone.

Water conditions along the mainland were the worst encountered in years. A red tide made underwater visibility practically zero. Several dives were made at Portuguese Bend and Pt. Dume but because of opaque water, coastal diving was discontinued.



M/V *Nautilus* and diving boat *Mollusk* Cruise 60N7, 60M2-Abalone.

Operations were shifted to the Isthmus at Santa Catalina Island where exploratory and inspection dives were made. On the Isthmus Reef the kelp (*Macrocystis*) had practically disappeared and the resident pink abalone (*Haliotis corrugata*) were small with shrunken meats. Several red abalone (*Haliotis rufescens*) from San Miguel Island, tagged and released on the Isthmus Reef in February 1957, were found at depths of 100 feet. They had moved from shallow water to the deeper, colder waters off the reef. Eagle Reef and Indian Rock areas were also examined and here, also, the thick kelp found on previous dives in 1957 had disappeared.

At Arrow Point, kelp and abalone were in approximately the same abundance as in 1957. Apparently the kelp growing along the shoreline of Santa Catalina Island is thick and healthy, while that on offshore reefs (Isthmus Reef, Eagle Reef, and Indian Rock) has practically disappeared. No evidence of commercial diving on the reefs off Santa Catalina Island was found. Several colored photographs were made of live green abalone (*Haliotis fulgens*) and white abalone (*Haliotis sorenseni*).

**M/V "N. B. Scofield" and Diving Boat "Mollusk"**  
Cruise 60S4, 60M3-Abalone. The investigations were continued (Aug. 3-14 and Aug. 20-30, 1960) by the Department's research vessel N. B. Scofield and diving boat Mollusk in waters off the islands of Santa Catalina, San Clemente, San Nicolas, Santa Barbara, Anacapa, Santa Cruz, Santa Rosa and San Miguel, and Carpenteria Reef on the mainland coast. The objectives were (1) to examine established abalone study stations at Santa Catalina and Santa Barbara Islands; (2) to establish stations at San Clemente and San Nicolas Islands; (3) to collect and photograph various species of abalone in color; (4) to collect and ship black (*Haliotis cracherodii*) and pink abalone (*H. corrugata*) to the Hawaii Department of Fish and Game for transplanting on the island of Oahu; and (5) to establish stations at San Miguel Island and to check areas of commercial diving.

Stations established at Santa Catalina and at Santa Barbara Islands were inspected. Tagged abalone were collected and measured for growth rate studies. At Santa Catalina Island some growth was noted among the smaller abalone but very little among the larger ones since 1959. There was less algal growth at these stations than was observed a year ago. Near shore at Santa Catalina Island the kelp was heavy and in good condition. At Santa Barbara Island kelp growth was good but the abalone were not abundant nor were the young present in great numbers.

A station site was selected on San Clemente Island at Seal Cove. At this location vegetation and kelp were in excellent condition, there was an abundance of fish, and the pink abalone showed evidence of rapid growth. The abalone there were approaching spawning. At a second station, established on the east side of San Clemente Island above Pyramid Cove, algae, abalone, and fish were less abundant than at Seal Cove.

At San Nicolas Island visibility was restricted because of heavy sediment carried by wave action. Two

temporary stations were established. At the station on the south side of the island, the kelp was in poor condition. Great numbers of kelp bass (*Paralabrax clathratus*) were seen and the few abalone present were in excellent condition and approaching the spawning season. At this station red abalone (*H. rufescens*) predominated.

At the station established on the northeast side of San Nicolas Island, kelp was very dense. There was considerable algal growth on the rocky substrate but only six pink abalone were found.

Many color underwater photographs were taken of various species of abalone. These pictures illustrate the differences in color and structure among the eight Californian abalones.

Young pink and black abalone could not be located in sufficient numbers to make an adequate shipment to Hawaii. They were not present in areas where found previously and high tides and rough waters prevented their being gathered from other known locations.

A station was established at San Miguel Island in a location fished by commercial divers. The red abalone at this station were numerous and in excellent condition. There was a heavy kelp bed, many invertebrates, and great numbers of fish at this station. San Miguel Island is not fished heavily by the commercial fleet because of rather constant adverse weather conditions during all but a few months of the year.

Exploratory dives were made at Anacapa Island, and at Gull Rock and Forney's Cove on Santa Cruz Island. Red, pink, and green abalones observed were few in number and small in size. At Yellow Bank, between Anacapa and Santa Cruz Islands, pink, red and white abalone were in close association with each other. They were large and of excellent quality. The bottom is rocky, ledge-like and covered with a thick growth of elk kelp (*Pelagophycus porra*). Because of the depth (75 to over 125 ft.) time on the bottom was limited and only a small part of the area could be examined. Due to strong winds, diving at Santa Rosa Island was confined to Becher's Bay. Only a few pink abalone were observed although a large area was inspected. At Carpenteria Reef, there was a muddy bottom with poor kelp growth and a few small pink abalone. This entire area had a "dead" look.

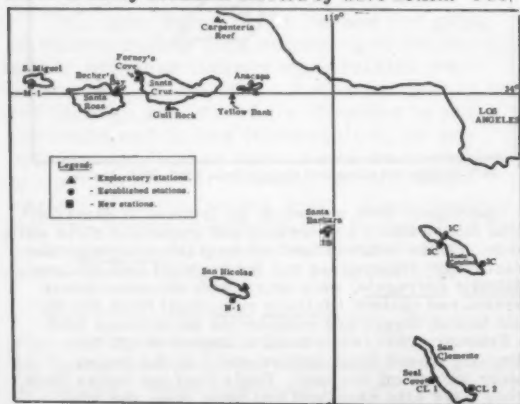
Note: Also see *Commercial Fisheries Review*, April 1960 p. 19.

\*\*\*\*\*

## ALBACORE TUNA OFF SOUTHERN CALIFORNIA STUDIED:

**M/V "Nautilus" Cruise 60N8-Albacore:** The area off southern California within the latitudes 32° N. to 35° N. and longitudes 118° W. to 123° W. was surveyed by the California Department of Fish and Game research vessel *Nautilus* from August 16-29, 1960. The objectives were (1) to fish for albacore with trolling gear and to tag, measure, and release all viable ones, using dart and type-G spaghetti tags alternately; (2) to hang a light from the stern each night while drifting and to collect the marine organisms attracted to it; (3) to record sea-surface temperatures and weather conditions on the fishing grounds; (4) to obtain blood samples from albacore unsuitable for tagging; and (5) to preserve albacore stomachs.

Of the 160 albacore caught 149 were measured, tagged and released in good condition. All were taken on trolling gear.





M/V Nautilus Cruise 60N8-Albacore Tagging (August 16-29, 1960).

Due to adverse weather conditions only 4 night light stations were occupied: 2 on the albacore fishing grounds 1 off Santa Rosa Island, and 1 at Santa Cruz Island.

Sea-surface temperatures were taken at least every 3 hours while scouting, and more frequently when in concentrations of fish. Weather and sea conditions were recorded intermittently throughout the day. Sea-surface temperatures ranged between 60.8° and 66.4° F. A majority of albacore (154) was caught in waters of 60.8° to 62.4° F. The remaining 6 were taken in 63.7° to 66.4° F. water. The largest albacore were caught in the warmer water.

\*\*\*\*\*

# PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 60A7-Pelagic Fish: The coastal waters from Punta Baja, Baja California, Mexico, to Point Dume and Santa Catalina Island, Calif., were surveyed (Aug. 11-30, 1960) by the California Department of Fish and Game research vessel Alaska. The objectives were: (1) to survey the sardine population to determine the amount of recruitment from the 1960 spawning and to measure the density of older fish; (2) to sample adult sardines, Pacific mackerel, jack mackerel and anchovies for age and distribution studies; and (3) to collect live sardines for genetic studies conducted



M/V Alaska Cruise 60A7-Pelagic Fish (August 11-30, 1960).

by the U. S. Bureau of Commercial Fisheries Laboratory at La Jolla.

Of the 78 light stations occupied, sardines were collected at 13, anchovies at 9, jack mackerel at 22, and Pacific mackerel at 14.

A total of 362 miles was scouted between stations and 67 schools were sighted, most of which were small spots making positive species identification unfeasible.

Weather conditions were generally good but a heavy swell hampered operations between Cabo San Quintin and Punta Banda.

Adult sardines (153-225 mm.) were sampled at 12 stations from Cabo San Quintin to Santa Catalina Island and young sardines (105-120 mm.) were taken at three stations between Punta Banda and the U. S.-Mexico border.

Approximately 200 live sardines were delivered to the U. S. Bureau of Commercial Fisheries in San Diego, for use in blood genetic studies.

Sea-surface temperatures ranged from 53.4° F. at Santo Tomas anchorage to 70.3° F. off La Jolla Point.

Note: Also see Commercial Fisheries Review, November 1960 p. 22.



## Cans--Shipments for Fishery Products, January-August 1960

Total shipments of metal cans during January-August 1960 amounted to 87,172 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 79,888 tons in the same period a year ago. The increase of about 9.1 percent in the total shipments of metal cans January-August this year as compared with the same period of 1959 was probably due to the sharp increase in the Alaska canned salmon pack.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



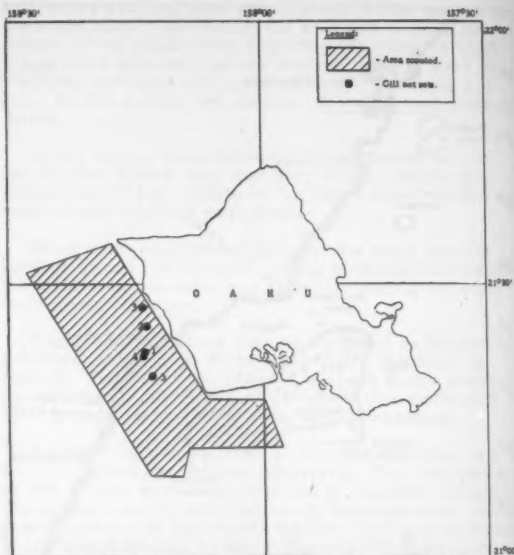
## Central Pacific Fishery Investigations

### EXPERIMENTAL NET FISHING FOR SKIPJACK TUNA:

M/V "Charles H. Gilbert" Cruise 49: Trial sets were continued (September 12-19, 1960) by the U. S. Bureau of Commercial Fisheries' research vessel Charles H. Gilbert in experimental gill-net fishing for skipjack tuna in the waters of Oahu's Waianae coast. Objectives of this cruise were to (1) determine the practicability of setting the gill net and retrieving it with a power block from the vessel; (2) establish procedures for setting and retrieving the gill net; (3) test gill net and power block as a device for capturing skipjack tuna under a variety of oceanographic conditions; (4) evaluate data collected by experiments with gill nets to determine the possibility of using tuna purse seines in this area; and (5) test sonic equipment and record various vessel and biological sounds.

The experimental gill net is composed of panels of webbing of  $4\frac{1}{2}$ - $11\frac{1}{2}$  inch stretched mesh, measured 304 fathoms long by 50 fathoms deep. The practicability of handling such a net was demonstrated in the trial set. The net was set in 3 minutes and 20 seconds on the first set. Several minor difficulties were encountered during retrieving but these were easily overcome and avoided on subsequent sets.

The net was payed out over the stern with the ship proceeding at 22 degrees starboard rudder and an engine speed of 1,000 r.p.m. The net was set in a circle as a result of this maneuver. Lines on both ends of the net were brought together to close the net as much as possible. During retrieving the net was passed through the power block and stacked on the main foredeck athwart ship, the headline to starboard and the corkline to port. The power block was situated at the end of the boom just inboard of the starboard rail about 15 feet



M/V Charles H. Gilbert Cruise 49 (September 12-19, 1960).

above the deck. The ship proceeded along the net as it was being hauled.

Sets were attempted 4 times around schools of skipjack in seas less than a foot in height. Two and 8 skipjack, 9-12 pounds in weight, were caught in the first two sets. No fish were caught in the last two sets. It was impossible to tell whether the skipjack had escaped before the net was completely set, through the larger meshes after the net was set, or through the thermocline and under the headline.

The failure of the gill net to encircle the skipjack schools indicates that the contemporary purse-seining method needs to be modified and the direction towards which it should be modified in order to catch skipjack. Modifications should be towards (1) increasing the time between the beginning of the set and detection (and likely escape) of the net by the skipjack, and (2) reducing the setting time. Lengthening the net so that the set can be started farther away from the school and distracting the school with live bait have been suggested to delay the detection of the net by the skipjack. One obvious way to reduce the setting time is to increase the ship's speed during setting.

A hydrophone from a Sonobuoy and a tape recorder were found to be a suitable combination for recording underwater sounds. Ship sounds at 4 knots and at  $1\frac{1}{2}$  knots, with only auxiliary engines, were recorded. Recordings were also made during the soaking and hauling phases of the gill-net operations.

Note: Also see *Commercial Fisheries Review*, Nov. 1960 p. 24.

\*\*\*\*\*

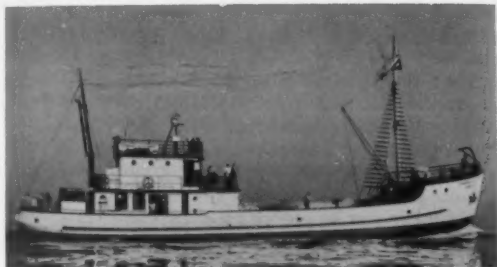
### FISHERY RESEARCH VESSEL "CHARLES H. GILBERT" ON 50th VOYAGE:

Half a hundred sailings was the record logged as the U. S. Bureau of Commercial Fisheries' research ship



Charles H. Gilbert left its Hawaiian base on October 12. Cruise 50 will take the 120-foot, 200-ton vessel south to Christmas Island, the Marquesas, the Tuamotus, and Tahiti on a two months' investigation of the biology of yellowfin and skipjack tuna. The waters along the Equator and around the island groups of the South Pacific are familiar territory to the vessel and its crew, as are the stormy albacore tuna grounds of the central North Pacific and the fog-bound waters of the West Coast. Ever since its delivery to the Bureau's Honolulu Biological Laboratory in April 1952, the ship has been on the go, from Adak to Papeete and from Astoria to Manzanillo, carrying parties of scientists over the central and eastern Pacific in search of knowledge about the tunas and their environment. The vessel has steamed, in the eight years of its service, more than 173,000 miles.

Originally equipped to do the long-line and live-bait fishing necessary to fill in the general picture of tuna distribution in the central Pacific, the ship has been progressively fitted out with a variety of specialized instruments and facilities as the interests of the scientists have become more sharply focused on specific aspects of the biology of the tunas. As the scope of the vessel's work has grown, so has the ship itself, with the addition of 28 feet of length in 1953 providing greater laboratory space, and the construction of a new bow section this year. The new bow contains one of the unique features of the vessel, an underwater viewing chamber for directly observing the behavior of tuna in the sea. With a matching installation of windows in the ship's bottom at the stern, the biologists are given a completely new insight into the movements of tuna schools and their response to various kinds of bait, fishing gear, and other stimuli.



The Service's research vessel Charles H. Gilbert.

The vessel's live-bait tank, in addition to its primary function of holding baitfish for use in pole-and-line fishing of tuna, has played a part in the introduction to Hawaiian waters of sardines from the Marquesas, and of snappers and other useful bottomfish from Tahiti and Mexico. The ship has been used for operating gill nets, as well as tuna long lines, and the recent addition of a power block makes it possible to handle nets of great size. A new trawl winch was installed this year for the operation of large midwater trawl nets to collect the young of the tuna and the variety of small animals on which tunas feed. This evolution of the Charles H. Gilbert to meet the needs of scientific research on elusive, fast-swimming, far-ranging species of fish has given the Honolulu Biological Laboratory a mobile marine research station that is probably as able and versatile as any vessel of comparable size. Whether the task is the collection of plankton in the North Pacific, or, as on the present cruise, taking samples of South Pacific tuna blood for serological studies, the Charles H. Gilbert

has met the demands made upon it in obtaining knowledge of the world's oceans and the fishery resources that inhabit them.

\*\*\*\*\*

## RESEARCH ON HAWAIIAN TUNA FISHERY BAIT PROBLEMS:

The annual skipjack landings in the State of Hawaii are frequently limited by an inadequate supply of live bait. The principal bait is nehu, a small anchovy.

During 1952, the Hawaiian Biological Laboratory of the U. S. Bureau of Commercial Fisheries began studies to determine the feasibility of supplementing the supply of natural bait. These studies included investigations into the use of artificial baits, introduction of Marquesan sardines into Hawaiian waters, the introduction of tilapia into various ponds and reservoirs in the State, the economics of rearing tilapia by hatchery methods, and the introduction of the threadfin shad. The objectives of these studies have been realized and they have been terminated.

**Artificial Bait:** The University of Hawaii, under contract, investigated the use of artificial bait during the period 1952-1953. The reactions of skipjack to both edible (agar, fish) and inedible (aluminum foil, mica flakes) materials were investigated. The results were generally negative or inconclusive.

**Marquesan Sardine:** The excellent live-bait qualities of the Marquesan sardine were demonstrated by Bureau vessels fishing for skipjack in waters of French Oceania. Hawaiian waters appeared to provide a suitable habitat for this species and an introduction of Marquesan sardines was made into Hawaiian waters in late 1955. Additional releases were made in 1956, 1957, and 1958. By 1957, adults in spawning condition were captured near the Island of Oahu and by September 1960, additional recoveries were reported from Kauai, Maui, Hawaii, Molokai, and Kahoolawe. Recoveries of young fish, indicating successful spawning in Hawaiian waters, were made during late 1958 and 1959. The State Division of Fish and Game placed restrictions on the capture of the Marquesan sardines in Hawaiian waters, pending their establishment. As these fish are now successfully established, the restrictions have been lifted, thus permitting Hawaiian fishermen to capture and use them as live bait.

**Tilapia:** Tilapia were first brought to Hawaii in 1951. From 1954 through 1956, sea tests were conducted to determine the effectiveness of these fish as a skipjack tuna bait. They proved to be an adequate bait fish, especially for the larger (18-24 pound) skipjack.



Investigation into the economics of rearing tilapia were made at a small hatchery near the laboratory (1956) and at a larger hatchery on the Island of Maui (1957-1959). Simultaneously with the 1959 operation

of the Maui hatchery, experiments were conducted at the Kewalo Basin Laboratory to test methods for inducing early spawning and to determine optimal salinity, sex ratios, brood stock concentrations, and type and rate of feeding.

The application of the results of the Kewalo Basin experiments to the Maui hatchery, coupled with a warmer spring, resulted in the 1959 production of 1,293,000 tilapia, exceeding that for 1958 of 1,074,000. Bait-size tilapia from the Maui plant yielded an average catch of 46-50 pounds of skipjack per pound of tilapia used as live bait. Comparable figures for nehu were 50-57 pounds of skipjack per pound of nehu.

The favorable results of the investigations, both as to the success and economics of rearing tilapia by hatchery methods and their use as live bait, encouraged the Hawaii State Board of Agriculture and Forestry to request funds from the State Legislature for the construction and operation of a tilapia hatchery. About \$180,000 were appropriated. A site has been selected and construction of the plant is presently under way.

**Threadfin Shad:** A large shipment of threadfin shad was received in Hawaii during August 1959. These fish, after acclimatization to fresh water, were planted in various rivers and reservoirs on the islands of Maui, Kauai, and Oahu. The first successful indication of shad spawning was reported from a reservoir on the Island of Oahu on May 1, 1960, where 20 small schools of 1.5-3 inch shad were observed. On June 11, 1960, more than 200 shad were caught from a reservoir on the Island of Maui. The average length at time of planting was 9.5 centimeters (about 3.7 inches). Successful spawning in the Maui reservoir was evidenced by the capture of shad as small as 1.9 centimeters (0.7 inch). With the successful completion of the project to introduce the threadfin shad into Hawaiian waters, this potential bait species (which is prolific, can tolerate fresh or sea water, and has been proven by sea tests to be an excellent bait fish) is now available to the Hawaiian skipjack tuna fishermen.



## Federal Purchases of Fishery Products

### DEPARTMENT OF DEFENSE PURCHASES, JANUARY-SEPTEMBER 1960:

**Fresh and Frozen Fishery Products:** For the use of the Armed Forces under the Department of Defense, 1.7 million pounds (value \$0.9 million) of fresh and frozen fishery products were purchased in September 1960 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in August by 29.1 percent and was 4.1

percent under the amount purchased in September 1959. The value of the purchases in September 1960 was lower, by 22.0 percent as compared with August, but was 0.4 percent higher than for September 1959.

During the first nine months of 1960 purchases totaled 17.7 million pounds (valued at \$9.2 million)--an increase of 1.3 percent in quantity and 2.4 percent in value as compared with the similar period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in September 1960 averaged 55.0 cents a pound, about 3.5 cents more than the 51.5 cents paid in August and 2.4 cents higher than the 52.6 cents paid during September 1959.

**Canned Fishery Products:** Salmon was the principal canned fishery product purchased for the use of the Armed Forces during Sep-

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, September 1960 with Comparisons

Product	QUANTITY				VALUE			
	Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
	1960	1959	1960	1959	1960	1959	1960	1959
Tuna	116	370	2,370	2,502	51	162	1,044	1,159
Salmon	2,304	3	2,308	18	1,565	3	1,568	14
Sardine	-	4	99	974	-	4	41	144

tember this year. The annual requirements of canned salmon by the Armed Forces are usually contracted for shortly after the end of the canned salmon packing season. In the first nine months of 1960, purchases of canned fish were up 36.7 percent as compared with the same period in 1959, due primarily to the heavy purchases of canned salmon in September of this year.

Note: Armed Forces Installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



## Fish Meal

### RESEARCH ON NUTRITIVE VALUE:

The research program on fish-meal quality by the U. S. Bureau of Commercial Fisheries College Park Technological Laboratory has revealed some interesting variations in chick-feeding tests. Over 39 fish-meal samples have arrived at the Laboratory. Of these, 19 have been analyzed for proximate composition and in a series of three different ten-day chick tests.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, September 1960 with Comparisons

QUANTITY				VALUE			
Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
1960	1959	1960	1959	1960	1959	1960	1959
1,686	1,758	17,722	17,488	928	924	9,188	8,973

The Laboratory reports that the first series has just been completed, and the results have demonstrated some interesting differences in the nutritive quality of the fish meals tested. The nutritive

quality of most of the fish-meal samples appears to be rather uniformly good, but a few appear to be considerably lower in quality than would be expected from a study of their processing history.



### Fisheries Loan Fund

#### FISHERIES LOANS APPROVED JULY 1 TO SEPTEMBER 30, 1960:

From the beginning of the Fisheries Loan Fund program in 1956 through September 30, 1960, a total of 802 applications for \$24,818,068 have been received. Of these, 435 (\$10,556,897) have been approved, 286 (\$8,094,575) have been declined or found ineligible, 68 (\$4,234,422) have been withdrawn by applicants before being processed, and 13 (\$796,505) are pending. Of the applications approved, 162 were approved for amounts less than applied for. The total reduction was \$1,135,669.

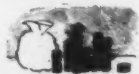
The following loans were approved during July, August, and September of 1960:

**New England Area:** Clinton-Serafina, Inc., New Bedford, Mass., \$70,000 and John S. Cottle, Narragansett, R. I., \$24,300.

**South Atlantic and Gulf Area:** Captain Frankie, Inc., Tampa, Fla., \$25,000 and Clarence E. Potter, Marathon, Fla., \$6,822.

**California:** Joe M. Medina, et al, San Diego, \$120,000; M. Machado Medina, San Diego, \$100,000; Joseph M. Nunez, San Diego, \$90,000; and Frank J. Souza, et al, San Diego, \$110,000.

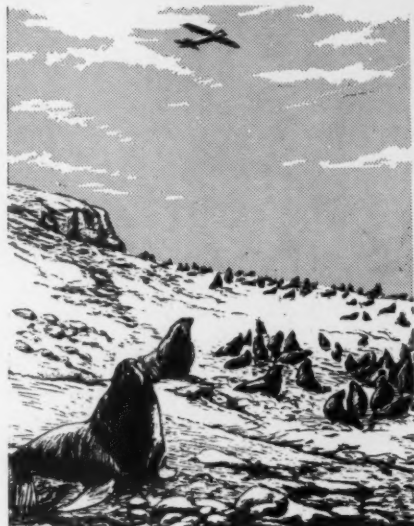
**Pacific Northwest Area:** Axel Buholm, Seattle, Wash., \$9,922; Erling E. and Harry J. Jacobsen, Seattle, Wash., \$41,872; and Robert K. Thompson, Port Angeles, Wash., \$4,200.



### Fur Seals

#### ALASKA FUR-SEAL SKIN HARVEST FOR 1960 LOWER:

The 1960 harvesting of fur seals on the Pribilof Islands, Alaska, was terminated August 15, with a crop of 40,616 skins. Included were 36,304 pelts from male seals and 4,312 pelts from female seals. This compared with a take of 30,176 male seals and 27,634 female seals in 1959.



The 1960 take of male seals included about 30,000 3-year-olds and 4,000 4-year-olds, as well as 2,000 2-year olds. The small size of the take of 4-year olds lowered the kill considerably below normal; usually 4-year-old seals contribute 30 to 40 percent of the year's kill. The small size of the 1956 year-class was recognized in 1959 when a shortage of 3-year-old animals caused a below-normal take, and the limited harvest this year had been expected because of this deficiency.

Since 1956 the U. S. Bureau of Commercial Fisheries has been engaged in a herd management program. Through maintenance of the herd at a level of maximum sustainable productivity, such fluctuations in the herd as were encountered in the 1956 year-class can be avoided in the future. It is expected that the value of the reduction in surplus-breeding stock accomplished since 1956 should soon be reflected in improvement in the annual crops of fur-seal skins.

\*\*\*\*\*

### ECONOMIC STUDY OF SEAL SKIN PRICES INITIATED:

An economic study of prices of Alaska's fur-seal skins has been started by the Bureau of Business Research, Boston College. This is being conducted under a contract awarded by the U. S. Bureau of Commercial Fisheries.

The annual harvest of fur-seal skins from the Pribilof Islands is divided three ways under an international treaty: the United States receives 70 percent of the skins, Canada 15 percent, and Japan 15 percent. The United States' share is now further divided under the Alaska Statehood Act--70 percent of the net income from the sale of the skins, after deduction of costs of administration of the Pribilofs, is turned over to the State of Alaska.

For budgetary purposes the Bureau of Commercial Fisheries must estimate the proceeds of the sales of skins for a period up to three years in the future. This study involves the analysis of factors which affect the price of Alaskan fur skins to provide methods by which the Bureau may estimate the prices which may be anticipated for periods up to three years.

\*\*\*\*\*

### PRICES FOR ALASKA FUR-SEAL SKINS AT FALL 1960 AUCTION HIGHER:

At the semi-annual auction sale of Alaska fur-seal skins held at St. Louis on October 20-21, 1960, a total of 28,210 United States-owned fur-seal skins was sold for \$2,510,890 for the account of the United States Government. Of these, 6,338 skins were the newly-developed "sheared" skins which were offered for sale for the first time. These are known as "Lakoda," a name derived from an Aleutian word meaning young female fur seal. The "Lakoda" skins, unlike the familiar "Matara," "Kitovi" and black Alaska fur seal skins are not dyed and the guard hairs are not removed prior to shearing. The new product was received enthusiastically by the fur trade. All skins are the product of the sealing operations of the U. S. Bureau of Commercial Fisheries on the Pribilof Islands. The 21,872 United States-owned dyed fur-seal skins (exclusive of the "Lakoda" skins) brought \$2,282,436 or about 0.5 percent less than the \$2,293,580 received for 22,561 such skins at the spring 1960 auction. However, the over-all average price of \$104.35 per skin paid at the fall 1960 auction was up about 2.6 percent from the av-

erage of \$101.66 paid at the spring auction and 1.1 percent higher than the \$103.23 average price received at the fall 1959 auction. The "Lakoda" skins, sold for the first time this fall, brought \$228,464 or an average of \$36.05 per skin.

At the fall 1960 auction, the average prices for the skins by types were: dust-brown or "Matara" \$103.22 per skin, black \$106.83, and the dark shade "Kitovi" \$101.50. Japanese Government fur-seal skins sold: black \$101.66, "Matara" \$96.01, average for all skins \$97.81. All South African fur-seal skins averaged \$46.31 and all Uruguayan skins averaged \$51.75.

Note: Also see Commercial Fisheries Review, June 1960 p. 28, and December 1959 p. 35.



### Great Lakes Fisheries

#### Exploration and Gear Research

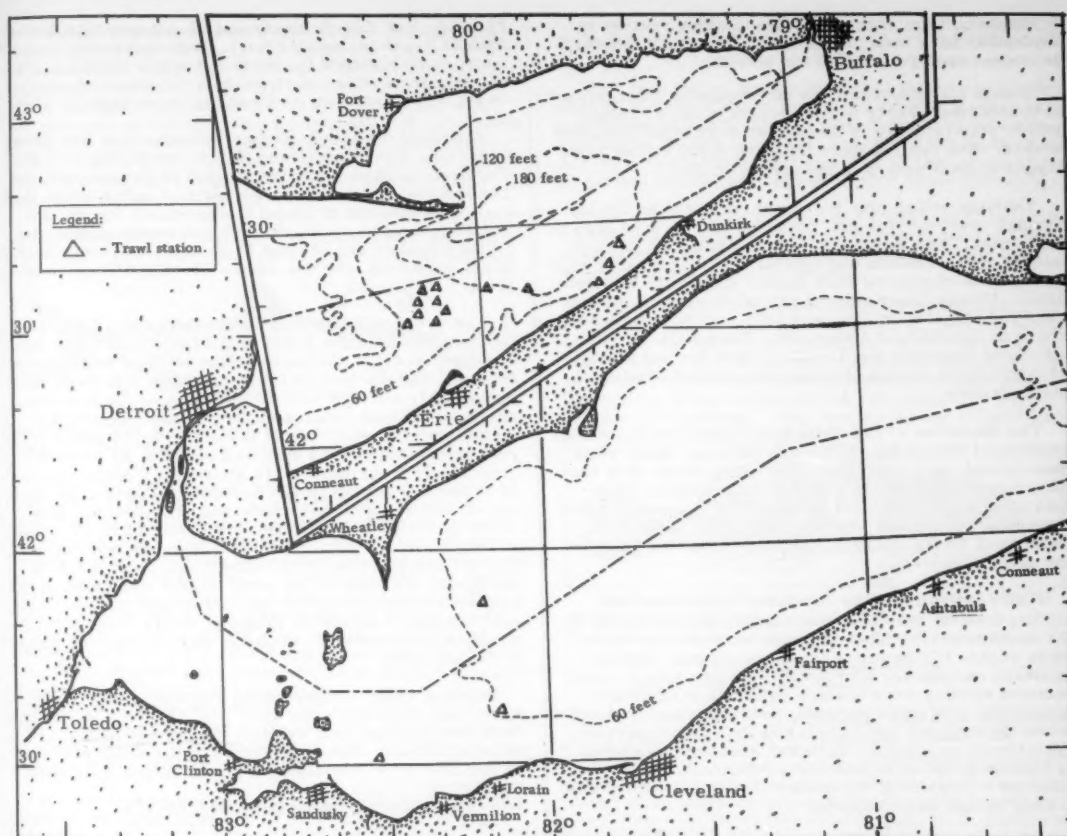
#### SEASONAL DISTRIBUTION STUDIES OF COMMERCIAL FISH STOCKS IN LAKE ERIE CONTINUED:

M/V "Active" Cruise 12: Trawl fishing and sounding operations were carried out (Aug. 30-Sept. 23, 1960) from Buffalo, N. Y., to Sandusky, Ohio, by the U. S. Bureau of Commercial Fisheries' exploratory fishing vessel Active. This survey was designed to determine seasonal abundance, distribution, and availability-to-otter trawls of smelt and other under-utilized species of fish in United States waters of Lake Erie.

Test trawling was conducted only where depth-sounder recordings indicated the presence of fish near the bottom. With exception of a relatively small area off Erie, Pa., extensive soundings and 15 subsequent fishing efforts were not very encouraging. Two 30-minute drags at a depth of 78 feet, 10½ miles northwest of Erie, produced a total of 2,450 pounds of 17-19 count smelt.

Some 5 additional drags made in 72 to 78 feet of water between Erie and Dunkirk, N.Y., caught smelt at rates of 50, 60, 78, 100, and 180 pounds per hour. Six other drags in this area at depths of 50 to 78 feet yielded only trace amounts of fish. Three of these 6 drags indicated the presence of large numbers of young-of-the-year smelt. Two 30-minute drags made in about 60 feet of water off Vermilion and Sandusky, Ohio, caught no smelt but the one off Vermilion took 90 pounds of yellow perch.





M/V Active, Cruise 12, Lake Erie (August 30 to September 23).

One 30-minute drag, made in Canadian waters about 20 miles southeast of Wheatly, Ont., caught 90 pounds of smelt from 66 feet of water.

The area between Erie and Vermilion and west of Sandusky revealed no fish near the bottom.

During the first two days of the cruise, the Active participated in a lake-wide synoptic survey involving 11 vessels and 6 research agencies including the Bureau of Commercial Fisheries. Objectives of the synoptic survey included making simultaneous oxygen determinations and related fish population analysis over all of Lake Erie.

Note: Also see Commercial Fisheries Review, Nov. 1960 p. 32.

## Great Lakes Fishery Investigations

### LAKE ERIE POPULATION SURVEY:

M/V "Musky II" September 1960: The U. S. Bureau of Commercial Fisheries research vessel M/V Musky II has replaced the chartered vessel George L. in its operations on Lake Erie. The Musky II is 45 feet long with a 14½-foot beam and is powered by a 671 GMC Diesel.

Late September water temperatures (70° F.) and turbidity (Secchi disc 3½ feet) in 1960 in the western basin were almost identical to findings in 1959 at the same stations. Summer water temperatures in 1960 were much cooler than in 1959.

The September trap- and gill-net catches of yellow pike from major ports in Ohio consisted almost entirely of yearling fish (hatched in 1959). Commercially-landed yearling yellow pike averaged about 14.2 inches long (maximum 16.2 inches) and slightly more than one pound in weight. Up to 50 pounds of yellow pike per trap-net lift were observed in some areas in the western basin. Prices of landed yearling yellow pike (Number 2's) dropped from about 50 cents per pound in early September to about 35-40 cents per pound in late



September. Commercial catches of other species in September have been very low and fishermen often are dependent upon yellow pike for profits.

Yellow pike apparently do not recognize International boundaries. Forty-seven percent of the 53 tagged yellow pike returned in September were from Canadian waters. The returns were from the 4,000 yellow pike tagged in Ohio waters in the spring of 1960.

Yearling yellow pike fed almost entirely on  $3\frac{1}{2}$ - to  $4\frac{1}{2}$ -inch young-of-the-year alewives and gizzard shad in September. The young alewives are abundant in most waters of the western and central basins, but large concentrations of gizzard shad appear only in the western basin. Unless heavy natural mortality occurs, gizzard shad and alewives in 1961 and 1962 may become a nuisance to commercial fishermen. Examination of fish stomachs indicated that alewives were feeding almost exclusively on animal plankton and gizzard shad on plant plankton.

The character of the white bass fishery in September resembled that of the yellow pike fishery. Most white bass landed were yearlings. They had grown very rapidly; the average yearling was about 10 inches long--maximum length was 11.3 inches. The relatively great abundance of both the 1959 and 1960 year classes of white bass should provide a reasonably strong fishery for several years.

Fish species listed as "suckers" in commercial landing reports have been examined at several ports in the western basin. Most abundant were the common white sucker (*Catostomus commersoni*) and central quillback carpsucker (*Carpiodes cyprinus hinei*). Less common species were eastern quillback carpsuckers (*Carpiodes cyprinus cyrinus*), northern shorthead redhorse (*Moxostoma aureolum*), and the spotted sucker (*Minytrema melenops*). Six other species of suckers are known to occur in Lake Erie. Bismouth buffalo, although a member of the sucker family, are listed separately in fish catch reports.

Although experimental trawl, and trap- and gill-net catches of yellow perch in September generally have been poor, anglers had phenomenal success in catching yellow perch along the south shore in the western basin. Many anglers caught 15-20 yellow perch per hour. An unusual number of young-of-the-year white crappie were taken in trawls this summer. Black crappie are much less abundant than white crappie in Lake Erie.

Note: Also see *Commercial Fisheries Review*, Nov. 1960 p. 32.

\*\*\*\*\*

## LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 8: The fish population survey in southern Lake Michigan was continued (September 20-October 4, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Gangs of nylon gill nets (50 feet each of  $1\frac{1}{2}$ - and  $1\frac{3}{4}$ -, 200 feet of 2-, and 300 feet each of  $2\frac{1}{2}$ -,  $2\frac{3}{4}$ -, 3-,  $3\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Grand Haven, Mich., and off Racine, Wis. The chub catch was moderately large at 25 fathoms off Grand Haven, but light in the other sets. Both 25-fathom sets contained small numbers of smelt and alewives, and both 50-fathom sets had a few deep-water sculpins.

Gangs of linen gill nets were set for 4 nights off Grand Haven at 25 fathoms (255 feet each of  $2\frac{1}{2}$ -,  $2\frac{3}{4}$ -,

$2\frac{5}{8}$ -,  $2\frac{3}{4}$ -, and 3-inch mesh) and 50 fathoms (510 feet of each of the above mesh sizes). Both these nets took many more bloaters (*L. hoyi*) and fewer individuals of non-bloater species of chubs than did identical nets set in the same locations on about the same dates in 1954.

A commercial-type 52-foot balloon trawl was fished at various depths off Grand Haven and Milwaukee, Wis. The chub catches were the largest in several cruises. The tows off Grand Haven were 4 to 7 miles south of an east-west line out of Grand Haven except for the 45- and 50-fathom tows which were just north of this line. Off Milwaukee the 30- and 35-fathom tows were 8-10 miles northeast, and the others 10-12 miles north of port.

The great difference in chub catches at 14 and 15 fathoms (consecutive tows) may be due to the fact that the upper limit of the thermocline touched bottom at 14 fathoms, and the bottom temperature at this depth was appreciably warmer than at 15 fathoms. Yellow perch, smelt and shiner catches in the two tows were also strikingly different: at 14 fathoms--1,134 perch (172 pounds), no smelt, 482 spot-tail shiners, 21 emerald shiners, 21 trout-perch, 171 alewives, 7 whitefish; at 15 fathoms--266 perch (44 pounds), 192 smelt, no shiners of either species, 74 alewives, 4 whitefish. Five of the 11 whitefish in the two tows were over 17 inches in length. The catch in the 10-fathom tow was much like the one at 14 fathoms, except that there were no whitefish. Catches at the other depths were almost exclusively chubs (95 to 100 percent of which were bloaters), except at 45 and 50 fathoms, where considerable numbers of deep-water sculpins were taken (181 pounds at 50 fathoms).

Surface water temperatures averaged about 64° F. Extremes recorded were 51.4° and 67.5° F. A well defined thermocline still existed, but the epilimnion has become thicker. Strong currents to the south prevailed on the east side of southern Lake Michigan throughout much of the cruise.

Note: Also see *Commercial Fisheries Review*, Nov. 1960 p. 32.

\*\*\*\*\*

## WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

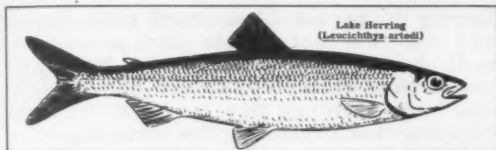
M/V "Siscowet" Cruise 6: The third and last cruise of the season to study the bathymetric and areal distribution of fish stocks in western Lake Superior was conducted (September 12-20, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Standard gangs of experimental gill nets and 30-foot semi-balloon trawls were fished at various locations and depths.

The experimental gill nets were fished just southeast of Gull Island and south of Stockton Island. Trawling operations took place southeast of Gull Island, Pike's Bay, between Outer and Cat Island, east and south of Cat Island, between Manitou and Otter Island, and between Ironwood and South Twin Island.

Four gangs of experimental gill nets were fished southeast of Gull Island at 15 fathoms to determine the differences in catches from successive 1-night sets and the differences between catches in 1-, 2-, 3-, and 4-night sets. Three gangs were set one day and a fourth on the following day. On the following 3 days, one each 1- and 2-night, 1- and 3-night, and 1- and 4-night sets were lifted with one net reset the first two days.

The catch increased with the number of nights only for the lake trout, lake herring, and smelt. There seemed to be little relationship between the duration of set and number of fish caught for the other species. However, the total number of fish caught increased with the duration of the set. The 2-night set took 59 percent more fish than the average of the 1-night sets; the 3-night set took 82 percent more fish than the average 1-night set; and the 4-night set took 153 percent more than the average 1-night set.

The lake herring taken in this experiment were extremely large. Two hundred and forty-four lake herring



were caught in the  $2\frac{1}{2}$ - to 5-inch mesh. These fish weighed 288.5 pounds, an average of 1.2 pounds each.

Experimental gangs of gill nets were set south of Stockton Island at 5, 15, 25, and 45 fathoms. Trawl tows took predominately ninespine stickleback, trout-perch, and slimy muddlers at all stations. Good samples of pygmy whitefish were taken between Manitou and Otter Island in 25 fathoms. These fish were nearly ready to spawn. A few small lake trout and whitefish were taken around Cat and Outer Island but none were young-of-the-year. Trawl tows in Pike's Bay at 20 fathoms, and near Cat Island and Outer Island at 25 fathoms yielded small lake trout which had the left pectoral fin clipped. These fish were planted by the Wisconsin Conservation Department in early May 1960. The distance from Outer Island to the nearest site of planting is about 18 miles. These catches give further evidence that the shore plant was successful.

Surface-water temperatures ranged from 58.7° F. south of Stockton Island to 56.3° F. southeast of Gull Island.

**M/V "Siscowet" Cruise 7:** In continuation of a long-term observation of environmental conditions and fish populations in western Lake Superior fall environmental conditions were studied (Sept. 26-Oct. 5, 1960) at index stations located southeast of Stockton Island, Northeast of Bear Island, and east of Pike's Bay. Standard gangs of gill nets were fished at each station, and trawling operations were conducted at the Stockton Island and Pike's Bay stations. Limnological data and materials were collected including: records on water temperatures, water samples for chemical analyses, plankton and bottom samples, and Secchi-disc readings.

There was a marked thermocline at the Stockton Island and Bear Island stations. At Bear Island the water temperature was about the same (56° F.) from the surface to 145 feet, at which point there was a rapid drop in temperature for the next 55 feet (thermocline), and at 200 feet the temperature was about 42° F. The temperature at the bottom (260 feet) was 40° F. Dissolved oxygen was found to be lowest at the surface (11.0 p. p. m.) and highest on the bottom (13.1 p. p. m.).

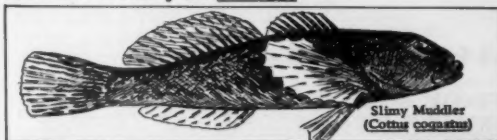
In addition to the environmental studies, trawling operations took place between South Twin and Ironwood Island, and oblique sets were made with bull nets (gill nets 300 feet long and 20 feet deep) southeast of Gull Island and northeast of Madeline Island. A standard

gang of gill nets was also set northeast of Madeline Island adjacent to the oblique bull net.

Bull nets fished southeast of Gull Island and northeast of Madeline Island were set from the surface to the bottom at 120 feet. The float line of the nets was marked at 20-foot intervals, and, since the depth of the net from float line to lead line was 20 feet, each section of the net fished overlapping 40-foot depth intervals.

The catch of lake herring per 1,000 feet of bull net that fished from the surface to 20 feet at the Gull Island station was 210 fish weighing 220 pounds. The catch decreased as the depth increased.

Trawl tows took predominately slimy muddlers and ninespine sticklebacks at all locations. Several small trout (5 to 14 inches) and whitefish were captured. No young-of-the-year trout have been seen this year. One 15-minute tow at 25 fathoms between Ironwood and South Twin Island captured 564 "bloaters" (*L. hoyi*) weighing 108 pounds. This was by far the largest catch made in a trawl by the Siscowet.



Surface-water temperatures ranged from 54.5° F. southeast of Gull Island to 58.2° F. in Pike's Bay. Note: Also see *Commercial Fisheries Review*, November 1960 p. 33.

\*\*\*\*\*

## SEA LAMPREY CONTROL FOR 1960 SEASON ENDED:

A number of streams tributary to Lakes Superior and Michigan were treated with chemicals for the destruction of lamprey larvae during the 1960 season by the U. S. Bureau of Commercial Fisheries Great Lakes Fishery Investigations biologists. It is anticipated that by the end of the year all of the lamprey-producing streams on Lake Superior will have been treated by United States and Canadian biologists. The seasonal change of water quality that impairs the selective action of the toxicant was more troublesome than usual this year and persisted longer. Sea lamprey research included bioassays at Hammond Bay and in the mobile unit to study further the seasonal trends of water quality. Surveys to define the distribution of the lamprey larvae in Lake Michigan tributaries have now been extended to the east shore.

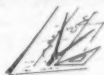


Superior will have been treated by United States and Canadian biologists. The seasonal change of water quality that impairs the selective action of the toxicant was more troublesome than usual this year and persisted longer. Sea lamprey research included bioassays at Hammond Bay and in the mobile unit to study further the seasonal trends of water quality. Surveys to define the distribution of the lamprey larvae in Lake Michigan tributaries have now been extended to the east shore.

Electrical control on Lake Superior terminated on September 2, 1960. The 35 barriers captured 39,694 adult sea lampreys; the same barriers took 46,838 adults during 1959 and 60,367 in 1958. The 1960 total represents a reduction of 15.3 percent from 1959 and 34.2 percent from 1958. However, after 2 consecutive years of declining numbers, the catch at the installations on the east half of Lake Superior increased. These barriers took 24,160 adults in 1960, 17,128 in 1959, and 21,487 in 1958. A drastic drop at the de-

vices on the west half of the Lake was great enough to overcome the increase in the east. The western barriers took 15,534 individuals in 1960 and 29,709 in 1959--a reduction of 14,175 adults or 47.7 percent. Over half of this drop occurred in the Brule River which took only 9,755 adult sea lampreys this season as compared to 19,386 in 1959.

The last of 17 electrical barriers on Lake Michigan was turned off on August 5, 1960. Two additional devices were operated by the Wisconsin Conservation Department as part of the network. The 19 devices killed or captured 16,704 adult sea lampreys. The 1959 network of 37 barriers took 27,552 adults. The 19 barriers operated in both years took 23,076 adults during 1959. The 1960 catch represents a reduction of 6,372 individuals, or 27.6 percent. This is the third consecutive year of a decline in the sea lamprey catches in streams tributary to Green Bay, Lake Michigan.



### Gulf Exploratory Fishery Program

#### BOTTOM FORMATIONS SURVEYED AND VARIABLE PITCH PROPELLER TESTED:

M/V "George M. Bowers" Cruise 29: A preliminary survey of Middle Ground bottom formations was conducted between July 29-August 8, 1960, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers operating in the Florida Middle Grounds approximately 80 to 90 miles south-southeast of Cape San Blas, Fla. This cruise was conducted through a cooperative agreement between the U. S. Bureau of Commercial Fisheries and the University of Florida Geology Department.



Service's exploratory vessel George M. Bowers.

Four diving stations were made at depths from 14 to 20 fathoms. Samples were taken of coral rock, sand, and sedentary organisms.

Still photographs and color motion pictures of the coral reefs were taken to supplement the observations and collections.

Cruise 30 (October 3-15, 1960): Underwater motion-picture studies of shrimp trawls in action were scheduled off Panama City, Fla. Due to heavy algae concentrations along the entire coastal area, photographic work was not attempted.

During the period, speed tests were conducted using the controllable pitch propeller recently installed on the George M. Bowers. Repeated runs were made over a  $1\frac{1}{4}$ -mile course in St. Andrews Bay, towing a 40-foot flat shrimp trawl. Holding the main engine constant at 800 r.p.m. and setting the propeller pitch at varying angles, accurate ground speed determinations were made. The information gained will be of considerable value in future shrimp-trawl work.

\*\*\*\*\*

#### MISSISSIPPI DELTA AREA SURVEYED FOR SARDINE-LIKE SPECIES:

M/V "Oregon" Cruise 70: Experimental fishing for sardine-like species using submarine lights, trap-lift nets, and a lampara net, was conducted in the Mississippi Delta area (September 6-25, 1960) by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. Most of the planned work for this cruise was not accomplished due to interruptions by hurricanes Donna and Ethel.

Seven night-light attraction stations were made using 100- and 250-watt submarine lights and 500-watt surface lights. Echograms showed the reaction of scad and round herring when a 100-watt light was lowered to a depth of 14 fathoms over bottom schools which were initially at a depth of 48 fathoms. On other occasions the schools moved up to midwater depths of 20 to 25 fathoms, but would not surface. Lift-net catches contained either mixed scad and round herring or round herring only. The highest catch was about 100 pounds of the mixed species.

Two large tuna schools were observed off the Mississippi Delta. One school was sampled with trolling jigs and yielded blackfin tuna weighing 4 to 10 pounds and skipjack weighing 3 to 12 pounds. Sea conditions were too rough to attempt setting the lampara net.

A total of 52 bushels of calico scallops was caught off eastern Alabama in 16 fathoms using a 25-foot shrimp trawl. One 30-minute drag yielded 40 bushels. These scallops were shipped to several concerns that are engaged in developing and testing mechanical shucking devices.



### Irradiation Preservation

#### MARKET FEASIBILITY STUDY FOR IRRADIATED FISHERY PRODUCTS UNDER WAY:

To determine the conditions under which radiation-processed fishery products should be marketed in order to provide the greatest over-all benefits to the fishing industry--producer, processor and distributor--and to the consumer, a study is being conducted by the U. S. Bureau of Commercial Fisheries for the Atomic Energy Commission.

A radiation-processing briefing session was held for Bureau marketing specialists at the Gloucester, Mass., Technological Laboratory to provide them with necessary background information for the study.

Bureau marketing specialists will be discussing the feasibility of marketing fishery products with fish producers, processors, and distributors, along with retail food groups and consumer specialists, such as newspaper food editors and extension people. A comprehensive analytical report on this study will be ready for submission to the Atomic Energy Commission on November 1, 1960.

The Atomic Energy Commission is reserving action on a number of research grants pending the outcome of this Bureau study on fish and a similar study on fresh fruits and vegetables being conducted by Stanford University.



### Maine Herring Investigations

#### RECOVERIES FROM TAGGING AID STUDIES:

The Penobscot River-Blue Hill Bay herring tagging program by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Maine, has been completed. Recoveries of herring tags from

the August 23, 1960, tagging at Moores Harbor, Isle Au Haut, have been unusually encouraging. Of 531 tagged herring released, 18 recoveries have been received.

Records from earlier tagging at Cutler, Maine, show that herring can move along the coast at 10 miles a day, the longest known movement having been 50 miles in 5 days. This knowledge has been used in revising sampling methods for age and growth studies.



### North Atlantic Fisheries Exploration and Gear Research

#### EXPLORATORY FISHING VESSEL "DELAWARE" BACK ON SCHEDULE:

The U. S. Bureau of Commercial Fisheries research vessel Delaware is back on its routine task of carrying out research projects designed to aid commercial fishing. The 500-ton vessel had an odd mishap last July when she became stuck halfway up a marine railway in a shipyard--she was being dry-docked for routine maintenance service and for the installation of a new underwater searching device whose purpose is to locate and track schools of fish as well as reveal the presence of underwater obstacles such as sandbars, shoals, sunken vessels, etc.



The Service's research vessel Delaware.



What proved to be a puzzling and complex problem of refloating the Delaware was overcome and she sailed from New London late in October on a cruise to familiarize Bureau personnel with the use of her new "seeing as well as hearing" aid which should permit the search of two miles of adjacent waters for the presence of fish.

The Delaware is being assigned to undertake cruises involving experiments with new and improved fishing gear, the distribution of fish populations, and collection of data for the project on future haddock resources underway at the Bureau's Woods Hole Biological Laboratory.

The Delaware, largest of the Bureau's research vessels, is manned by a crew representing experience in both commercial fishing and fisheries research and is used to carry on activities designed to: explore potential fisheries and fishing grounds; estimate the seasonal availability and the migrations of possible commercial species; introduce more efficient methods of harvesting the resources either by improvement of existing gear or by the introduction of fishing gear not customarily used in this area, and to develop, test, and evaluate electronic and other aids new to the commercial fishing industry.



## North Atlantic Fishery Investigations

### SURVEY OF DISTRIBUTION AND ABUNDANCE OF GROUND FISH IN INSHORE NURSERY AREAS CONTINUED:

The vessel Capt. Bill Hill, chartered by the U. S. Bureau of Commercial Fisheries' Biological Laboratory at Woods Hole, Mass., completed the third of a series of cruises, to determine the distribution and abundance of bottom food fishes found in inshore waters. Special emphasis was placed on the small haddock which might be taken by trawlers using small-mesh gear, and upon the young-of-the-year haddock which were beginning to settle to the bottom in September. The survey was made in the vicinity of Cape Cod and the area between Cape Ann and the Isles of Shoals.

Haddock, whiting, and herring were found to be the most abundant of the food fishes.

Dogfish were so numerous and so destructive to fishing gear that many stations could not be sampled.

Two types of drift bottles have been released on each cruise. The surface drift bottle floats on the top water layer at the whim of the tide, current, and wind. The bottom drag bottles, ballasted so as to float just off the bottom, are moved by the currents on the ocean bottom.

These bottles are released in order that a more thorough understanding of the movement of the water in the Gulf of Maine may be applied to the movement of fish sought by the commercial fishermen.



## Omaha, Nebraska

### CONSUMPTION OF FROZEN FISH AND SHELLFISH IN RESTAURANTS AND INSTITUTIONS:

Although Nebraska is landlocked, frozen fishery products are purchased and served by the many restaurants and institutions in the city of Omaha, according to a 10-city survey made by Crossley S-D Surveys, Inc., for the U. S. Bureau of Commercial Fisheries.

About nine-tenths of the 174 establishments surveyed reported buying fishery products during the 12 months ending November 1958. About 48 percent of these said they purchased frozen processed fish in November 1958; 32 percent frozen processed shellfish; and 27 percent bought portions. Institutions (such as schools and hospitals) made more use of frozen processed fishery products than did public eating places.

Haddock fillets were the most popular and also the leading fish in total quantity purchased. More than two-fifths of the Omaha users of frozen processed fish bought haddock fillets during November 1958. Ocean perch fillets were the second most popular item, while cod and halibut fillets scored high on the list.

Almost half of the shellfish users in Omaha bought breaded shrimp during the survey month. Many bought frozen raw shrimp, which was the leader in terms of total quantity purchased.

More than a fourth of all the establishments in Omaha bought portions during No-



vember 1958. In this category, Omaha ranked first among the 10 cities, in percentage of



establishments buying portions. The portions most widely purchased were uncooked and breaded and the quantity purchased was much greater than that of any other type. In comparing portion-purchases, more than half of the establishments bought about the same amount during November 1958 as the year before. About one-fourth said they bought more, while 9 percent said they bought less. More than 90 percent of the users were satisfied with the present preparation, quality, and condition of both fish and shellfish. Satisfaction with the same features of frozen fish portions was unanimous by purchasers in Omaha.

The major advantages of portions were convenience and ease of preparation, cited by 67 percent of users... fast and timesaving, by 51 percent... size and uniformity, by 36 percent. Frying was the leading method of cooking frozen processed shellfish, fish, and portions. The average establishment served almost two-thirds of its shellfish fried, about 53 percent of its processed fish fried, and 78 percent of its portions fried. Baking was also a common cooking method for processed fish. The average establishment served 33 percent of this type fish baked.

Three-fourths of the profit-making establishments, which expressed an opinion, considered frozen processed fishery products more profitable than other high protein foods.



## Oregon

### NEW SHRIMP TRAWLING GROUNDS FOUND OFF COAST:

The first signs of good shrimp trawling grounds have been reported in waters offshore of Bandon (Coquille Point), Oregon, by biologists aboard the U. S. Bureau of Commercial Fisheries research vessel, John N. Cobb, as a result of a cooperative survey with the Oregon Fish Commission. Oregon Fish Commission biologists reported on October 10, 1960, that more than a week of exploration for new shrimp grounds off Coos Bay was not rewarding as the area was too rocky for trawling. Experimental drags off Coos Bay made in areas fished by commercial fishermen revealed only small numbers of shrimp.



South of Coos Bay soundings by electronic equipment proved the area offshore of Bandon soft and free of rocks, and subsequent trawling produced some fair-sized shrimp at a depth of from 90 to 105 fathoms. The field party chief on the vessel explained that, while experiments thus far are inconclusive as to concentrations of shrimp in sufficient quantities to establish a commercial fishery, the Bandon area presented the best grounds for trawling so far.

The John N. Cobb will continue exploring for shrimp grounds north to the Umpqua area (weather and time permitting) and as far north as Newport. (Fish Commission of Oregon, October 11, 1960.)

\*\*\*\*\*

### SALMON REARING LAKE CONSTRUCTION BEGINS:

A contract for construction of facilities for the 20-acre Lake Wahkeena fish-rearing experiment was awarded on October 19, 1960, by Oregon's Fish Commission.

Fish-rearing ponds and lakes are relatively new in Pacific Northwest fish culture. The use of both artificial and natural ponds

and lakes for salmon rearing is proving to have merit. The impoundments vary in size from a few acres to many square miles. The small fish planted in these basins are expected to subsist on natural foods, but feeding of hatchery food may be necessary. Preliminary results have been encouraging.

The plan is to construct a 20-acre pond in the former stream bed between the old and new U. S. Highway 30 in the Columbia River Gorge area at Wahkeena Creek, about 15 miles west of Bonneville Dam. Facilities will be provided to prevent Columbia River water and scrap fish from entering the lake. Specified numbers of salmon fry will be obtained from the Bonneville Hatchery and released in the lake where they will feed naturally. Physical and chemical tests of the water will be made and biological information collected to determine the natural productivity of the lake. Release of the fish will be early in the year, prior to plantings initiating a new cycle.

On a smaller scale, a similar rearing lake of 8 acres on the Millicoma River near Coos Bay is in operation where the fish are fed artificially instead of naturally. The Millicoma Lake is owned by a timber company and the fish rearing is supervised by the Fish Commission. Early in February 1960, 80,000 silver salmon fingerlings were liberated from this pond into the East Fork of the Millicoma River which runs into the Coos River.

The Wahkeena operation will be for the purpose of determining the most economical method of rearing large numbers of juvenile silver salmon in a pond. Current practice is to stock about 2,000 fish per surface acre without feeding, but this varies from pond to pond and year to year. Future tests may be made to determine whether the pond production can be increased by fertilizing the water and by artificial feeding.

In order to maintain the natural productivity of the water once the pond is filled, only sufficient stream water for desirable oxygen levels and temperatures will be allowed to flow into the lake. The remainder will flow down the present channel into the Columbia River.

Fish will be collected at intervals throughout the year to study the growth of the young silver salmon used in rearing studies.

The fish to be used will be planted as yolk-sac fry in the early part of the year. Length of rearing time will depend on water conditions in the Columbia River, consistent with natural migration time.

Fish will be allowed to migrate at will and be counted as they move over the spill-



way. However, if a large number of fish remain in the pond, it will be drained to enumerate and liberate these fish into the Columbia and then refilled in time to receive a new crop of young fish.

Wahkeena Creek offers little spawning area to returning adults. Mature migrants will be trapped in Wahkeena Creek, spawned by hatchery personnel, and hatched at Bonneville Hatchery to provide a supply of eggs to maintain the pond.

It will take four months to complete the lake which should be ready to accommodate the small salmon by March 1961.



## Oysters

### MARYLAND OBSERVATIONS ON SPAWNING AND SETTING AS OF OCTOBER 1, 1960:

An interesting light oyster set occurred in St. Marys River, Maryland, during mid-September 1960. No heavy late set was found at any of the stations conducted by the Maryland Chesapeake Biological Laboratory. While water temperatures generally were still high enough up to October 1 to permit some spawning, it seems quite unlikely that further setting will occur this year. The oysters were spawned out and water temperatures were about due to fall below the level at which spawning occurs.

Very few observations of the commercial set on planted shells had been made. A report of counts made by the Department of Tidewater Fisheries indicated a valuable set on the dredged-up shells planted in Pig Cove. The latest count of a composite sample taken across those shells by a light scrape showed 810 spat per bushel.

The picture of oyster mortalities is one of major concern. The organism "MSX" associated with the Delaware Bay losses has become more widespread in the lower Chesapeake. The Virginia Fisheries Laboratory reported substantial oyster losses in June and again in September in the lower James, the Mobjack

Bay area, and at points along the Bay side of the Eastern Shore of Virginia. The organism has been found in most tributaries of the lower Eastern Shore as far up as Pocomoke Sound and in the lower part of the Rappahannock.

At the Maryland sampling stations in Holland Straits, Pocomoke Sound, and Fishing Bay "MSX" had not yet been found but an increased mortality from the fungus *Dermocystidium* occurred in late summer and early fall, especially in Holland Straits. This fungus has been observed for many years in the lower Bay and is found generally up to the Solomons area, and to a light extent in deep water in the Choptank River off Castle Haven Point. It often causes some mortality at this season but has not appeared in other portions of the State and apparently does not thrive in low salinity areas.

Oxygen deficiencies occurred in the Chesapeake during August that probably caused losses among oysters in deep water at locations where mixing of the water is poor. This condition disappeared after mid-September. A few reports of deep-water oyster losses, probably a result of the above condition, were reported this season.

The spread of "MSX" is almost certain to affect oysters in the lower portions of Maryland in the near future. An intensive survey of the oyster beds in all Maryland areas was started early in October 1960 in cooperation with the U. S. Bureau of Commercial Fisheries and the Department of Tidewater Fisheries.

It is not yet known whether or not stable low salinity waters, such as occur in the upper Chesapeake, will serve as a barrier to destructive mortalities of the Delaware Bay type. Laboratory experiments at Solomons are being started where the development of "MSX" infections at low salinities can be determined.

It is extremely important that no transplantings be made of "MSX"-infected oysters to uninfected areas, either in waters of high or low salinity. In the higher salinities it is known that such infected oysters will succumb rapidly and can infect other oysters. In low salinities a similar but undetermined risk exists.

Continued research by all agencies upon oyster mortalities is planned to include: (1) accurate determination of rates of mortality by all agents under different environmental conditions; (2) complete knowledge of the life cycle of the "MSX" organism; (3) the method of infection of oysters by "MSX"; (4) the role in oyster mortality played by bacteria, virus infection, and other organisms; (5) the effects of changed environmental conditions upon oyster mortality; and (6) the selection and development of resistant strains of oysters in affected areas. Much time and painstaking effort is needed to gain adequate knowledge of this nature. ("Third Report of Spat-fall and Other Oyster Observations - 1960 Season," Maryland's Chesapeake Biological Laboratory, Solomons, Md.)

\*\*\*\*\*

#### STANDARDS RESEARCH PROGRAM SHIFTED FROM VIRGINIA LABORATORY:

The Government-Industry Cooperative Oyster Research Program (GICORP) sponsored and financed by the U. S. Bureau of Commercial Fisheries, the U. S. Food and Drug Administration, and the Oyster Institute of North America, has shifted its research operations from Gloucester Point, Va., to the U. S. Bureau of Com-

mercial Fisheries Technological Laboratory, College Park, Md. The College Park location will not alter the research progress, but will allow closer contact with the research team by the Research Director of GICORP who is also located nearby on the campus of the University of Maryland.

Preliminary evaluation of the data collected over the past two years by the research team indicates that possibly the work in the Middle Atlantic area can be completed within a short time. The research team will then move on to the Gulf and West Coasts to determine the physical and chemical characteristics of the oysters when processed under the procedures used in those areas. Those objective tests developed in the initial survey in the Chesapeake Bay area will be used to classify the characteristics of the oysters in the additional areas. The extension of the work to these other areas is necessary to provide a basis for the development of a single standard of identity applicable to all domestically-produced fresh-shucked oysters.



## Scallops

### CALICO SCALLOP FISHERY IN FLORIDA:

**Supply:** Exploration by U. S. Bureau of Commercial Fisheries research vessels in 1960 located extensive scallop (*Pecten gibbus*) grounds off the Florida east coast from Daytona Beach southward to Ft. Pierce in a depth range from 10 to 32 fathoms. Commercial concentrations are now known to exist over a 1,200 square mile area, perhaps the largest known scallop bed in the world. Simulated commercial production, based on 16 experimental tows by the exploratory fishing vessel *Silver Bay* along the 20-fathom curve, produced 135 bushels ranging from 1 to 13 per 30-minute drag for an average of 8.5 bushels. Highest catch rate with a 10-foot New England-type dredge was 24 bushels per tow. Predominant size range in experimental catches was 2 inches to 2½ inches diameter shell. Commercial production by industry has not yet been undertaken.

Other scallop beds had been located off Cape San Blas, Fla., as early as 1957 in the vicinity of Panama City. The greatest exploratory catch rates, as high as 40 bushels per tow, were in 10- to 20-fathom depths. Local producers have periodically utilized scallops in this area as the price and demand situation warranted.

Other exploration has shown that sizable scallop concentrations exist in the Core Banks area off North Carolina. Some commercial fishing of these stocks started in 1959. Little is known about the biology of the calico scallop or about the growth rate. Some studies have recently been started by the Bureau's Gulf Breeze (Fla.) Biological Laboratory.

**Cost of Gear:** A modified Georges Bank-type scallop dredge, 10-foot mouth with 2-inch rings and 1½-inch mesh liners, costs approximately \$350 (perhaps less for local construction).

Estimated cost of rigging shrimp vessel for scalloping, including dredges, is \$1,000 to \$2,000 depending on vessel design. As far as is known at this time, no vessels have been converted.

**Yield:** Florida east coast catches in the spring of 1960 yielded 4 to 5 pints of meats per bushel of shell stock. Average meats run 900 to 1,100 per gallon. There is a definite variation in yield and quality, but the exact causes are yet undetermined. Further exploratory fishing planned on a seasonal basis should shed some light on these factors. It is assumed that these are associated with seasonal conditions of water temperature, maximum spawning activity, or some mortality factor.



Fig. 1 - The yield of one drag by the exploratory fishing vessel Silver Bay on the Florida east coast calico scallop grounds.

**Shucking:** Hand shucking is comparatively slow because of small size, shape of shell, and necessity for separating scallop meats from viscera. Mechanical shuckers are being investigated. One type of mechanical oyster shucker is reported to open 250 bushels of scallops per hour, but will not separate meats from viscera. The blanching of the scallops with steam causes muscle release on both shells. Scallops are then tumbled in a cylindrical drum where the shells exit from the end and meats and viscera fall through.



Fig. 2 - Shucked calico scallop meats aboard the exploratory fishing vessel Silver Bay.

Shell particles are separated from the meats by flotation. Industry members are experimenting with this method. The Bureau's Technological Laboratory at

Pascagoula is exploring the use of a centrifuge as a separator. There is a possibility that an egg-spinning machine can be adapted for this purpose. The Laboratory has also developed a prototype combination hot water and vacuum apparatus to accomplish production-line mechanical shucking. All developments are still in the early experimental stages; however, some machine makers have shown interest in development of equipment.

**Quality:** Tender, tasty, appetizing. From limited observations, keeping quality under refrigeration appears good. Pascagoula Technological Laboratory is running some experiments on freezing and storage with final results unavailable until storage time elapses.

**Market Situation:** Supply of New England scallops is now very plentiful. The Florida Development Commission is active in promoting the use of calico scallops and development of beds as well as possible market outlets. Any large-scale production of calico scallops will require active market promotion to acquaint consumers with the product. New product development with scallop ingredients offers another possibility for improved market.

**Byproduct Possibility:** Scallop waste or viscera has been shown by Japanese researchers to have unusual growth rate stimulation when mixed with poultry feed. Research needs to be done on this for a more definite determination of scallop waste value as applied specifically to calico scallops.

\*\*\*\*\*

#### CHEMICAL COMPOSITION TO BE STUDIED:

The chemical composition of sea scallops is the objective of a joint research project by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass., and the Biological Laboratory at Woods Hole, Mass.

The biologists will collect sea scallops together with information on maturity and state of sexual development and on the area from which they were caught. The Technological Laboratory will analyze the adductor muscle (edible portion) and viscera of the samples for proximate composition, sodium, potassium, and amino acids. It is hoped through this cooperative program, to be able to obtain information on some of the basic factors that contribute to changes in the chemical composition of scallops and to provide additional data that may be useful in biological research on this shellfish. The study will continue for at least a year, during which time it is planned to expand this joint effort to include other species of fish and shellfish.

\*\*\*\*\*

#### LANDINGS FROM GEORGES BANK TO BE LOWER IN 1961:

The unusual abundance of sea scallops on certain parts of Georges Bank in 1959-60 was the result of an unusually heavy set in 1955, according to U. S. Bureau of Commercial Fisheries biologists.

The Bureau's Woods Hole Laboratory biologists first found the 1955-year class in May 1959, when they were still too small to be of commercial value. At that time it was possible to catch up to 3,000 scallops in a 30-minute drag of a 10-foot scallop dredge.



The New Bedford scallop fishing fleet began to fish on that ground in July 1959. At first, they kept only the larger individuals of the 1955 age group, but by November 1959 all had grown large enough to be harvested, and by that time this single age group accounted for over 90 percent of the landings from that ground.

By May of 1960, the population in the area had been reduced to the point where it was only possible to catch about 800 sea scallops in a 30-minute drag. They were, of course, larger and the fleet continued to work the ground until September of this year when it was finally abandoned.

The same situation, although not quite so spectacular, had prevailed on two other grounds during the same period. Those grounds also appeared to be about fished out by September 1960.

Bureau records show that a drop in landings has always occurred in the fall. About 60 percent of an average year's landings of sea scallop meats are made between April and September. The colder, windier months of October through March account for only about 40 percent of a year's total. On this basis alone, landings are expected to decline some.

In addition, the 1956 age group, which is now large enough to be worth shucking, is not present in as great numbers as the unusually abundant 1955 age group. Bureau biologists, therefore, expect that landings of sea scallop meats will drop somewhat during the last 3 months of 1960 to the level of about 3.5 million pounds which prevailed during the last quarter of the years 1955-1958.

Landings in 1961 will no doubt be lower than in 1960, but whether they will be lower than 2 or 3 years ago depends upon the abundance of the 1957 age group which will enter the fishery in the summer and fall of 1961. As part of its investigation of the many factors that affect the abundance of commercially-important species of our marine resources, the biologists will sample the 1959 age group in the spring of 1961.



## Shrimp

### LOUISIANA INITIATES MARKING PROGRAM:

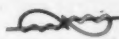
The Louisiana Wild Life and Fisheries Commission, Oysters, Water Bottoms, and Seafood Division, initiated a shrimp-marking program in the summer of 1960. The program is part of a cooperative effort of the Gulf States Marine Fisheries Commission and the U. S. Bureau of Commercial Fisheries to determine patterns of movement of certain species of shrimp from the nursery ground, located in the estuarine areas along the Gulf Coast, to the offshore fishery where these shrimp are captured by the commercial shrimp fisheries, according to the Commission Director.

During the second week of June 1960, workers of the Louisiana Wild Life and Fisheries Commission caught and marked with a biological stain, 12,000 juvenile brown shrimp, *Penaeus aztecus*. These shrimp were taken, marked, and released in the western portion of Mississippi Sound.

Under this program, juvenile shrimp will be stained and released in two additional areas. The areas are the Barataria Bay Estuarine Composite and the Vermilion Bay Estuarine complex. Over 10,000 brown shrimp will be marked and released, at each site, with hope of a good recovery.

A reward is offered for each marked shrimp returned. By establishing this reward it is hoped that more cooperation and interest will be stimulated among the shrimp fishermen, dealers, and processors. "A surveillance and coverage of the shrimp fishery along with organized advertising of the staining program will insure a higher recovery of marked shrimp. The returns should be of sufficient quantity to yield valid data which will be utilized in formulating management plans to protect, promote, and prolong one of our most valuable marine resources," the Chief of the Oysters, Water Bottoms and Seafood Division said.

Fifty cents reward will be paid for each returned shrimp, stained with a fast green biological dye. The chemical is harmless to humans. (Louisiana Conservationist, July-August-September 1960.)



## Sport Fishing

### ALMOST TWENTY MILLION FISHERMEN IN 50 STATES:

During 1959 a total of 19,914,021 fishermen in 50 states purchased one or more licenses to fish, the U. S. Department of the Interior reported on October 30, 1960. This is a slight decline of 1.3 percent from the number of fishermen reported during 1958.

Fishermen in 50 states spent a total of \$50,374,832 for fishing licenses, tags, permits, and stamps required by state fish and game departments to legally fish for sport or recreation. During 1958 sport fishermen spent \$45,410,462 for the same purposes. Expenditures for 1959 exceeded those for 1958 by \$4,964,370.



Examination of certified data for 1959 indicates that the number of persons buying one or more licenses to fish for sport or recreation varies from year to year. The number of licenses sold is influenced by types of licenses available to fishermen, weather conditions, the relative abundance of fish and other factors.

Table 1 - Summary of Number of Paid Fishing License Holders, License Sales, and the Cost to Fishermen in United States, July 1, 1958 to June 30, 1959

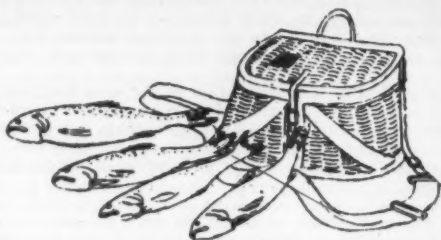
States	Paid Fishing License Holders <sup>1/</sup>	Total Fishing Licenses, Tags, Permits, and Stamps Issued <sup>2/</sup>	Gross Cost to Fishermen
Alabama	511,882	519,717	\$ 784,548.30
Alaska	31,886	51,990	127,388.94
Arizona	205,895	210,180	567,514.00
Arkansas	489,729	489,729	1,205,713.55
California	1,475,977	3,407,196	6,230,229.31
Colorado	406,130	406,130	1,458,737.50
Connecticut	109,018	109,072	418,032.89
Delaware	11,524	11,960	22,395.60
Florida	495,333	521,180	1,052,795.50
Georgia	500,565	515,758	669,217.25
Hawaii	2,383	2,383	5,116.00
Idaho	244,570	244,828	948,750.00
Illinois	699,300	699,300	1,512,636.25
Indiana	742,131	746,012	1,047,068.25
Iowa	400,447	383,301	753,024.87
Kansas	254,715	254,720	522,456.75
Kentucky	402,393	402,393	969,836.85
Louisiana	192,290	192,290	259,106.00
Maine	218,226	220,008	781,088.62
Maryland	95,765	97,323	330,155.75
Massachusetts	226,305	227,642	648,888.88
Michigan	1,056,462	1,259,034	3,072,276.00
Minnesota	1,238,250	1,409,751	2,110,002.15
Mississippi	264,144	273,419	559,782.12
Missouri	665,819	794,700	1,815,826.75
Montana	232,731	232,731	493,728.50
Nebraska	191,979	228,442	454,815.00
Nevada	58,164	59,026	253,175.50
New Hampshire	134,118	134,297	439,959.04
New Jersey	153,608	239,349	602,429.90
New Mexico	143,075	143,075	541,987.40
New York	783,362	980,511	2,205,416.75
North Carolina	400,495	475,812	862,562.75
North Dakota	87,304	87,304	93,752.00
Ohio	838,708	875,766	1,208,197.50
Oklahoma	469,638	469,638	1,047,524.50
Oregon	325,278	403,438	1,240,599.75
Pennsylvania	629,635	647,314	2,132,285.00
Rhode Island	15,717	21,942	52,977.87
South Carolina	278,079	280,244	540,752.70
South Dakota	138,893	138,988	264,056.00
Tennessee	791,393	885,132	1,137,190.50
Texas	825,793	825,793	1,776,195.19
Utah	190,960	195,036	558,881.47
Vermont	111,795	111,795	266,246.25
Virginia	403,245	558,554	735,635.00
Washington	366,366	366,366	1,561,239.87
West Virginia	207,899	249,289	455,187.65
Wisconsin	1,032,463	1,032,480	3,051,755.00
Wyoming	162,184	189,383	525,693.00
Totals	19,914,021	22,861,880	\$50,374,832.17

1/A paid license holder is one individual regardless of the number of licenses purchased. Data certified by state fish and game departments.

2/Period covered not identical to period covered by certification for all states.

Source: Compiled from information furnished by state fish and game departments.

Some state fish and game departments require sportsmen to purchase separate licenses



tags, permits, or stamps for fishing different species of fish as well as for fishing in different areas. Other states issue only one fishing license which is good for all species of legal fish. Thus, the total number of tags, licenses, permits, or stamps sold is not an accurate reflection of the number of persons holding paid licenses to fish.



## Tuna

### PROGRESS MADE IN STUDIES ON COMPOSITION:

A project to determine the composition of tuna and tuna-like fish has been under way for more than a year in the U. S. Bureau of Commercial Fisheries Technological Laboratory in Seattle, Wash. Compared to other salt-water species, it has been determined as of August 1960, that tuna and tuna-like fish are low in moisture and sodium and high in protein. The oil content varies within the range of 1 percent to 15 percent.

The study involves the collection of two series of ten fish each, taken each season over a three-year period. The investigation of skipjack is in its first year and albacore in its second year. Some exploratory composition work has also been done on both bluefin and yellowfin tuna.



## U. S. Fishery Landings, January-August 1960

Landings of fish and shellfish in the United States during the first eight months of 1960 totaled 3.0 billion pounds—about 3 percent less than for the same period of 1959.

Table 1 - United States Fishery Landings of Certain Species for Periods Shown, 1960 and 1959<sup>1/</sup>

Species	Period	1960	1959	Total 1959
..... (1,000 lbs.) .....				
Anchovies, Calif.	8 mos.	2,200	2,022	7,174
Cod:				
Maine .....	8 mos.	2,400	2,290	2,694
Boston 2/ .....	8 "	11,100	13,046	17,709
Gloucester 2/ .....	8 "	2,200	2,216	3,233
Total cod ...		15,700	17,552	23,636
Haddock:				
Maine .....	8 mos.	2,300	2,405	3,405
Boston 2/ .....	8 "	54,700	52,990	72,378
Gloucester 2/ .....	8 "	9,500	10,219	12,103
Total haddock ..		66,500	65,614	87,886
Halibut 3/:				
Alaska .....	8 mos.	19,300	20,414	22,537
Wash. and Ore.	8 "	15,300	16,201	17,908
Total halibut ..		34,600	36,615	40,445
Herring:				
Maine .....	8 mos.	105,800	83,174	117,150
Alaska (season over) .....	9 "	56,000	107,444	107,444
Industrial fish, Me. & Mass. 4/ .....	8 "	30,900	72,482	103,312
Mackerel:				
Jack .....	8 mos.	43,600	15,810	37,507
Pacific .....	8 "	14,100	12,792	37,602
Menhaden .....	8 "	1,482,200	1,528,240	2,193,866
Ocean perch:				
Maine .....	8 mos.	55,100	51,089	75,225
Boston .....	8 "	700	1,968	3,280
Gloucester .....	8 "	47,100	40,663	58,197
Total ocean perch		102,900	93,720	136,702
Salmon:				
Alaska .....	9 mos.	203,000	147,278	147,278
Washington ...	7 "	2/ 4,000	2/ 5,668	42,308
Oregon .....	7 "	2/ 2,400	2/ 2,866	5,329
Sardines, Pacific to Oct. 6		29,100	19,775	74,367
Scallops, sea (meats), New Bedford ...	8 mos.	13,000	12,294	18,814
Shrimp (heads-on):				
South Atlantic & Gulf States ...	8 mos.	130,200	120,289	219,509
Wash. ....	7 "	1,200	2,045	3,046
Oregon .....	7 "	400	2,114	2,734
Squid, Calif. ....	8 "	800	15,482	19,653
Tuna, Calif. ....	to Sept. 30	226,000	227,800	254,786
Whiting:				
Maine .....	8 mos.	10,700	21,923	23,339
Boston .....	8 "	200	492	687
Gloucester ...	8 "	40,700	44,040	61,797
Total whiting ..		51,600	66,455	85,823
Total all above items		2,616,000	2,657,531	3,766,371
Others (not listed)		430,000	489,101	1,333,629
Grand total ..		3,046,000	3,146,632	5,100,000

1/ Preliminary.

2/ Landed weight.

3/ Dressed weight.

4/ Excludes menhaden.

Table 2 - United States Fishery Landings by States for Periods Shown, 1960 and 1959<sup>1/</sup>

Area	Period	1960	1959	Total 1959
..... (1,000 lbs.) .....				
Maine .....	8 mos.	203,300	186,289	265,958
Massachusetts 2/:				
Boston .....	8 mos.	76,200	79,741	113,257
Gloucester ...	8 "	136,500	161,489	228,723
New Bedford ..	8 "	58,200	77,943	107,961
Provincetown ..	8 "	17,700	17,183	27,700
Total Mass. ..		288,600	336,356	477,641
Rhode Island 3/:	7 mos.	38,400	80,968	101,548
New York 3/ ..	7 "	25,900	23,217	39,367
New Jersey 3/ ..	7 "	39,700	33,093	63,404
Maryland 3/ ..	8 "	40,100	42,106	60,847
North Carolina 3/	8 "	38,200	41,737	62,724
South Carolina 3/	8 "	10,700	9,288	18,654
Georgia .....	7 "	11,500	9,610	21,513
Florida 3/ .....	7 "	82,200	79,288	148,724
Alabama .....	8 "	14,400	12,100	14,022
Mississippi 3/ ..	6 "	7,100	8,055	78,886
Louisiana 3/ .....	4 "	20,600	21,670	94,191
Texas 3/ .....	8 "	32,300	40,731	92,613
Ohio (season: Mar.-Dec.) .. (Mar.-July)		13,900	14,361	18,586
Alaska:				
Halibut 4/ ...	8 mos.	19,300	20,414	22,537
Herring (season over) .....	9 "	56,000	107,444	107,444
Salmon .....	9 "	203,000	147,278	147,278
Washington ...	7 "	57,600	70,563	156,200
Oregon .....	7 "	25,700	26,974	51,700
California:				
Certain species 5/ 8 mos.		315,600	293,681	431,089
Other .....	5 "	31,200	35,632	82,339
Total Calif. ..		346,800	329,313	513,428
Hawaii .....	6 mos.	4,700	7,031	16,570
Rhode Island, Middle Atlantic, Chesapeake, South Atlantic, and Gulf States (menhaden only)   8 mos.		1,466,000	1,499,746	2,158,423
Total all above		3,046,000	3,146,632	4,731,558
Others not listed		6/	6/	368,442
Grand total		6/	6/	5,100,000

1/ Preliminary.

2/ Landed weight.

3/ Excludes menhaden.

4/ Dressed weight.

5/ Includes catch of anchovies, jack and Pacific mackerel, Pacific sardines, squid, and tuna. Data on tuna are through September 30 and on Pacific sardines through October 6.

6/ Data not available.

Note: Data principally represent weight of fish and shellfish as landed except for mollusks which represent the weight of meats only.

The greatest declines occurred in production of fish used in the manufacture of fish meal and oil. Landings of these fish in Maine and Massachusetts during the first eight months of 1960 were down 42 million pounds while the menhaden catch decreased 46 million pounds compared with the same period of 1959. Total landings of herring in Alaska dropped from 107 million pounds in 1959 to 56 million pounds. Among the species used primarily for food, production of whiting during the first eight months of the year dropped 15 million pounds below that of the comparable period of 1959.

A considerable increase was reported in the Alaska salmon fishery which totaled 203 million pounds in 1960--a gain of 56 million pounds over 1959. Compared with the same period of 1959, landings of Pacific sardines through October 6, 1960 (29 million pounds) were up 9 million pounds; the catch of California tuna through September 30 (226 million pounds) remained almost the same; and the production of jack mackerel during the first eight months increased 28 million pounds.

On the Atlantic Coast the first eight-months' catch of Maine herring increased 23 million pounds and ocean perch landings rose 9 million pounds over the same period of 1959. During the first eight months of 1960, shrimp landings of 130 million pounds--up 10 million pounds over the comparable period of 1959--were reported in the South Atlantic and Gulf States.



## United States Fishing Fleet<sup>1/</sup> Additions

### JULY 1960:

A total of 48 vessels of 5 net tons and over were issued first documents as fishing craft during July 1960--a decrease of 12 vessels

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, July 1960

Area	July		Jan. - July		Total 1959
	1960	1959	1960	1959	
	(Number)				
New England . . .	7	2	19	10	15
Middle Atlantic . .	2	1	11	6	12
Chesapeake . . .	3	11	41	56	106
South Atlantic . . .	7	15	34	59	76
Gulf . . . . .	7	12	50	88	135
Pacific . . . . .	16	11	87	70	97
Great Lakes . . . .	2	-	9	5	6
Alaska . . . . .	4	8	18	28	32
Total . . . . .	48	60	269	322	479

Note: Vessels have been assigned to the various areas on the basis of their home ports.

as compared with the same month in 1959. The Pacific area led with 16 vessels, while the New England, South Atlantic, and Gulf

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, July 1960

Net Tons	Number
5 to 9 . . . . .	24
10 to 19 . . . . .	14
20 to 29 . . . . .	3
30 to 39 . . . . .	2
40 to 49 . . . . .	1
50 to 59 . . . . .	2
60 to 69 . . . . .	1
230 to 239 . . . . .	1
Total . . . . .	48

areas were next with 7 each. Alaska followed with 4 vessels, the Chesapeake with 3, and the Middle Atlantic and Great Lakes with 2 each.

During the first seven months of

1960, a total of 269 vessels were issued first documents as fishing craft--53 less than were reported during the same period of 1959. Most of the decline occurred in the Gulf area--38 vessels less as compared with the 1960 seven-months period.

\*\*\*\*\*

### AUGUST 1960:

During August 1960, 45 vessels of 5 net tons and over were issued first documents as fishing craft--an increase of 9 vessels

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, August 1960

Area	August		Jan. - Aug.		Total 1959
	1960	1959	1960	1959	
	(Number)				
New England . . .	6	1	25	11	15
Middle Atlantic . .	1	-	12	6	12
Chesapeake, . . .	7	4	48	60	106
South Atlantic . . .	6	8	40	67	76
Gulf . . . . .	10	14	60	102	135
Pacific . . . . .	12	7	99	77	97
Great Lakes, . . .	3	-	12	5	6
Alaska . . . . .	-	2	18	30	32
Total . . . . .	45	36	314	358	479

Note: Vessels assigned to the various areas on the basis of their home ports.

as compared with the same month of last year. The Pacific area led with 12 vessels. The Gulf was second with 10 vessels followed by the Chesapeake with 7, and the New England and South Atlantic areas with 6 each. The Great Lakes and the Middle Atlantic areas accounted for the remaining 4 vessels.

During the first eight months of 1960, a total of 314 vessels were issued first documents as fishing craft--44 less than the same

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, August 1960

Net Tons	Number
5 to 9 . . . . .	28
10 to 19 . . . . .	8
20 to 29 . . . . .	4
40 to 49 . . . . .	2
50 to 59 . . . . .	2
250 to 259 . . . . .	1
Total . . . . .	45

period of 1959. Most of the decline occurred in the Gulf area--a drop of 42 vessels, as compared with the eight-months period of last year.



## U. S. Foreign Trade

### EDIBLE FISHERY PRODUCTS, AUGUST 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States:

<sup>1/</sup>Includes both commercial and sport fishing craft.

during August 1960 increased by 6.2 percent in quantity and 8.7 percent in value as compared with July 1960. The increase was due primarily to higher imports of frozen albacore and other tuna (up 2.5 million pounds), fresh and frozen salmon (up 1.2 million pounds), and to a lesser degree, an increase in the imports of canned tuna in brine, frozen shrimp, and lobster and spiny lobster. The increase was partly offset by a 3.8 million-pound decrease in the imports of groundfish fillets and blocks.

Compared with August 1959, the imports in August this year were up by 14.1 percent in quantity and 21.7 percent in value due to higher imports of frozen albacore and other tuna (up 8.4 million pounds), and frozen shrimp (up 1.3 million pounds). Compensating, in part, for the increases was a drop of about 1.0 million pounds in the imports of fresh swordfish and canned salmon (down 1.0 million pounds).

U. S. Imports and Exports of Edible Fishery Products, August 1960 with Comparisons						
Item	QUANTITY		VALUE			
	August		Year		August	
	1960	1959	1960	1959	1960	1959
	(Millions of Lbs.)		(Millions of \$)			
Imports:						
Fish & shellfish:						
Fresh, frozen, & processed <sup>1/</sup>	98.0	85.9	1,070.5	27.5	22.6	309.6
Exports:						
Fish & shellfish:						
Processed only <sup>1/</sup> (excluding fresh & frozen)	2.3	4.6	68.0	1.5	1.6	22.8

<sup>1/</sup>Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in August 1960 were higher by 9.2 percent in quantity and 50.0 percent in value as compared with July 1960. Compared with the same month in 1959, the exports this August were lower by 50.0 percent in quantity and 6.2 percent in value. The lower exports in August this year as compared with the same month in 1959 were due mainly to the much lower exports of California sardines. Exports of high value fishery products, such as canned shrimp and both canned and frozen salmon, were higher this August than the same month of 1959.

\*\*\*\*\*

#### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States dur-

ing the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-October 1, 1960, amounted to 37,708,987 pounds, according to data compiled by the Bureau of Customs.



#### U. S. Production of Fish Sticks and Portions, July-September 1960

The United States production of fish sticks during the third quarter of 1960 amounted to 13.9 million pounds, while the production of fish portions totaled 12.0 million pounds. This was a gain in production of 7 percent for fish sticks and 40 percent for portions as compared with the same quarter of 1959. Most of the increase in fish-stick production occurred in cooked sticks (up almost 1.0 million pounds). The increase in portions was attributed to a greater production of raw breaded portions (up 2.5 million pounds).

Table 1 - U. S. Production of Fish Sticks by Months and Type, July-September 1960 <sup>1/</sup>			
Month	Cooked	Uncooked	Total
	(1,000 Lbs.)		
July	3,454	317	3,771
August	4,553	393	4,946
September	4,733	479	5,212
Total 3rd quarter 1960	12,740	1,189	13,929
Total 3rd quarter 1959	11,789	1,209	12,998
Total first 9 months 1960	43,344	3,392	46,736
Total first 9 months 1959	41,132	3,746	44,878

<sup>1/</sup>Preliminary.

Table 2 - U. S. Production of Fish Portions by Months and Type, July-September 1960 <sup>1/</sup>					
Month	Breaded			Un- breaded	Total
	Cooked	Un- cooked	Total		
	(1,000 Lbs.)				
July . . . . .	518	3,399	3,917	185	4,103
August . . . . .	556	2,770	3,326	127	3,453
September . . . . .	859	3,318	4,177	270	4,447
Total 3rd quarter 1960 . . . . .	1,933	9,487	11,420	582	12,002
Total 3rd quarter 1959 . . . . .	1,095	7,000	8,095	486	8,581
Total first 9 months 1960 . . . . .	5,318	27,509	32,827	1,410	34,237
Total first 9 months 1959 . . . . .	3,722	20,514	24,236	1,852	26,088
1/Preliminary.					

<sup>1/</sup>Preliminary.

Cooked fish sticks (12.7 million pounds) made up 91 percent of the fish stick total. The remaining 9 percent consisted of raw fish sticks. A total of 11.4 million pounds of breaded fish portions (of which 9.5 million pounds were raw) and 582,000 pounds of un-breaded (raw) portions was processed during the third quarter of 1960.



The Atlantic Coast was the principal area in the production of fish sticks and portions with a total of 18.8 million pounds. The remaining 7.1 million pounds of sticks and portions were packed in inland, Gulf, and Pacific Coast States.

Table 3 - U. S. Production of Fish Sticks by Areas, July-September 1960 and 1959

Area	1960 <sup>1/</sup>		1959 <sup>2/</sup>	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	22	11,447	24	10,812
Inland and Gulf States	4	1,277	6	1,213
Pacific Coast States	8	1,205	10	973
Total	34	13,929	40	12,998

<sup>1/</sup>Preliminary.

<sup>2/</sup>Revised.

Table 4 - U. S. Production of Fish Portions by Areas, July-September 1959 and 1960

Area	1960 <sup>1/</sup>		1959 <sup>2/</sup>	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	20	7,363	23	4,351
Inland and Gulf States	6	4,433	8	4,093
Pacific Coast States	5	206	4	137
Total	31	12,002	35	8,581

<sup>1/</sup>Preliminary.

<sup>2/</sup>Revised.

Table 5 - U. S. Production of Fish Sticks by Months, 1956-1960

Month	1960 <sup>1/</sup>	1959 <sup>2/</sup>	1958 <sup>2/</sup>	1957	1956
			(1,000 Lbs.)		
January . . .	5,503	6,265	5,471	4,261	4,862
February . .	6,534	6,340	5,925	5,246	5,323
March . . .	7,836	5,594	5,526	5,147	6,082
April . . .	4,867	4,708	4,855	4,492	3,771
May . . .	3,706	4,398	4,229	3,380	3,873
June . . .	4,361	4,575	4,702	3,522	3,580
July . . .	3,771	3,783	4,574	3,821	3,153
August . . .	4,946	3,872	4,358	4,643	4,166
September .	5,212	5,343	5,328	4,861	4,085
October . .	-	5,831	5,485	5,162	5,063
November .	-	4,822	5,091	4,579	4,585
December .	-	4,734	5,467	4,014	4,019
Total . . .	-	60,265	61,011	53,128	52,562

<sup>1/</sup>Preliminary (includes revisions for first six months).

<sup>2/</sup>Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1958-1960

Month	1960 <sup>1/</sup>	1959 <sup>2/</sup>	1958
			(1,000 Lbs.)
January . . .	3,620	2,692	1,973
February . .	3,451	3,025	1,254
March . . .	4,615	3,225	1,471
April . . .	3,415	2,634	2,268
May . . .	3,196	2,684	1,478
June . . .	3,938	3,247	1,504
July . . .	4,102	2,227	2,161
August . . .	3,453	2,796	1,516
September .	4,447	3,558	1,566
October . .	-	4,314	2,560
November .	-	3,483	1,979
December .	-	3,262	2,060
Total . . .	-	37,147	21,790

<sup>1/</sup>Preliminary (includes revisions for first six months).

<sup>2/</sup>Revised.

During the first nine months of 1960, a total of 46.7 million pounds of fish sticks was produced--an increase of 4 percent compared with the corresponding period of the previous year. Fish portions (34.2 million pounds) were 31 percent greater than the nine-months period of 1959.

Note: See *Commercial Fisheries Review*, September 1960 p. 33.



## Wholesale Prices, October 1960

The mid-October 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) at 129.4 percent of the 1947-49 average was up slightly (1.0 percent) from the preceding month and up 6.9 percent from the same month of 1959. From September to October, higher prices for fresh large haddock, oysters, frozen fillets, frozen shrimp, and canned fish were just about balanced out by lower prices for fresh haddock fillets, fresh shrimp, frozen halibut, and the fresh-water varieties. Wholesale prices in October 1960 increased over October 1959, due mainly to higher prices for fresh and frozen shrimp, oysters, fresh large haddock, frozen salmon, and canned fish. These increases more than offset lower wholesale prices for fresh and frozen haddock fillets, fresh-water whitefish and yellow pike, and frozen halibut.

The wholesale price index for the drawn, dressed, and whole finfish subgroup in October declined 2.0 percent from the preceding month. Normal price declines for fresh-water whitefish and yellow pike at New York following the Jewish holidays, plus a slight drop (1.0 percent) in the frozen dressed halibut price and a drop of 4.0 percent in salmon prices (due to change-over from fresh to frozen pricing) accounted for the change. An increase of about 2 cents a pound (17.5 percent) in large haddock prices at Boston partially compensated for the decline. From October 1959 to this October, the wholesale price index increased 8.2 percent, due to higher large haddock prices (up 10.6 percent) and frozen dressed salmon prices (up 14.1 percent). These increases were offset in part by lower prices for fresh-water whitefish and yellow pike, and frozen dressed halibut (down 4.2 percent).

The fresh processed fish and shellfish subgroup wholesale price index in October declined 1.2 percent from September. A



slight drop (1 cent a pound) in the small haddock fillet price at Boston plus a sharper drop of about 10.0 percent in fresh shrimp prices at New York more than offset a 7.2-percent higher shucked oyster price at Norfolk, Va. However, from October 1959 to October 1960, the subgroup price index rose by 5.0 percent due to a higher (11.1 percent) oyster price and a 4.1-percent increase in the fresh shrimp price. These increases were partly offset by a sharply lower price (28.2 percent) for fresh small haddock fillets.

In mid-October 1960 the wholesale price index for the frozen processed fish and shellfish subgroup rose by 5.1 percent as compared with September. A jump of about 5 cents a pound or 7.2 percent in the frozen 26-30 count shrimp price at Chicago plus increases of  $\frac{1}{2}$ -1 cent a pound in the frozen

fillet items (due in part to healthier inventories) were responsible for the increase. From October a year ago to October 1960 the subgroup price index increased 8.7 percent. Frozen shrimp prices were up sharply (19.8 percent). This, plus less pronounced increases of 3.7 percent in ocean perch and 2.6 percent in flounder fillet prices, more than offset a drop of 10.8 percent in the frozen small haddock fillet price.

The canned fish subgroup price index continued to inch upward in October as compared with the preceding month and the same month of 1959 due mainly to short supplies of canned pink salmon. The October 1960 index for canned fish at 109.6 percent of the 1947-49 average was up 2.9 percent from September and 5.6 percent above October 1959. In October 1960 the canned pink salmon price

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, October 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <sup>1/</sup> (\$)		Indexes (1947-49=100)			
			Oct. 1960	Sept. 1960	Oct. 1960	Sept. 1960	Aug. 1960	Oct. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					129.4	128.1	124.4	121.1
Fresh & Frozen Fishery Products: . . . . .					143.7	143.7	138.5	134.0
Drawn, Dressed, or Whole Finfish: . . . . .					166.4	169.8	158.1	153.8
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.14	.12	141.5	120.4	88.9	127.9
Halibut, West., 20/80 lbs., drsd., fresh or froz. . . . .	New York	lb.	.31	.31	94.4	95.4	109.9	98.5
Salmon, king, lge. & med., drsd., fresh or froz. . . . .	New York	lb.	.90	.94	202.2	210.6	202.2	177.2
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.74	.74	183.5	183.5	158.7	185.9
Whitefish, L. Erie pound or gill net, rnd., fresh . . . . .	New York	lb.	.74	1.00	149.7	202.3	149.7	202.3
Yellow pike, L. Michigan & Huron, rnd., fresh . . . . .	New York	lb.	.58	.77	134.8	179.4	170.0	161.8
Processed, Fresh (Fish & Shellfish): . . . . .					135.3	137.0	131.6	128.9
Fillet, haddock, sml., skins on, 20-lb. tins . . . . .	Boston	lb.	.31	.32	103.8	108.9	90.2	144.6
Shrimp, lge. (26-30 count), headless, fresh. . . . .	New York	lb.	.65	.72	102.7	114.1	106.6	98.7
Oysters, shucked, standards . . . . .	Norfolk	gal.	7.50	7.00	185.6	173.2	173.2	167.1
Processed, Frozen (Fish & Shellfish): . . . . .					115.7	110.1	112.6	106.4
Fillet, Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.39	.39	102.1	100.8	102.1	99.5
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.29	.28	91.0	87.9	84.8	102.0
Ocean perch, skins on, 1-lb. pkg. . . . .	Boston	lb.	.28	.27	112.8	108.7	108.7	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg. . . . .	Chicago	lb.	.74	.69	114.2	106.5	111.5	95.3
Canned Fishery Products: . . . . .					109.6	106.5	104.8	103.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	27.00	25.50	140.9	133.0	127.8	127.8
Tuna, K. meat, chunk, No. 1 1/2 tuna (6-1 1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9
Sardines, Calif., w.m. pack, No. 1 oval (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	7.75	7.65	91.0	89.8	83.9	88.1
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	8.75	8.75	93.1	93.1	93.1	93.1

<sup>1/</sup>Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

rose \$1.50 a case or 5.9 percent from the preceding month and was 10.3 percent (\$2.50 a case) above October a year earlier. Other items in the canned fish subgroup were about unchanged in October 1960 from a month earlier and either unchanged (Maine sardines) or slightly higher for California sardines (up 3.3 percent) and light meat tuna (up 2.3 percent). The packing season for Maine sardines was about over at the end of October with a pack up moderately from the 1959 season. The catch and pack of southern California sardines for the first two months of the September 1-December 31 season were extremely poor. The California pack of canned tuna, although very good, was falling 1-2 percent behind the good pack of 1959 as October 1960 ended.



### American Samoa |

#### TUNA LANDINGS, SEPTEMBER 1960:

In September 1960, tuna receipts at the tuna cannery in American Samoa amounted

American Samoa Tuna Landings, September 1960				
Species	September		January-September	
	1960	1959	1960	1959
	(1,000 Lbs.)			
Albacore . . .	2,356	2,077	17,450	15,284
Yellowfin . . .	130	322	1,991	3,431
Big-eyed . . .	10	63	1,165	748
Skipjack . . .	-	-	10	4
Total . . .	2,496	2,462	20,616	19,467

Note: Majority of the tuna was landed by Japanese long-line vessels; a small amount was landed by a South Korean long-line vessel.

to about 2.5 million pounds, or close to 1.4 percent above the landings in August. Landings for January-September 1960 of 20.6 million pounds were up 5.9 percent from the 19.5 million pounds landed during the first nine months of 1959.



### Whiting

#### FISH HELD IN REFRIGERATED SEA WATER STAYS FRESH LONGER:

Applied research on methods of extending the storage life of fresh dressed whiting while being held for processing has been completed by the Gloucester Technological Laboratory of the U. S. Bureau of Commercial Fisheries. With the completion of organoleptic tests and proximate analyses of whiting held in refrigerated sea water and in crushed ice, commercial-scale experiments are to be carried out in a fish plant in Rhode Island. A 3,000-pound-capacity refrigerated sea-water unit has been installed in the plant to conduct the tests in the near future.

Results of the laboratory experiments have shown that fresh dressed whiting stored in refrigerated sea water are of good quality after 11 days of storage. In contrast, fresh whiting stored in ice (similar to the usual commercial practice of storage before processing) are of good quality only up to 7 days and are of only fair quality after 11 days.



### DEEPEST OCEAN DIVE

The recorded depth reported in under this title in the August 1960 issue (p. 13) of the Commercial Fisheries Review was based on preliminary data. Later studies of the data revealed that the bathyscaph Trieste, operated by the United States Navy Electronics Laboratory, dived 35,805 feet to the bottom of the Challenger Deep in the Marianas Trench, in the Pacific, on January 23, 1960. At that time a preliminary figure, for the depth of the dive, of 37,800 feet was released, but it was emphasized that it was an uncorrected figure.

During the first week of February, the depth gauge used on the deep dive was recalibrated at the Naval Weapons Plant at Washington, D. C. On the basis of this new calibration, the true depth of the Challenger Deep was recalculated from assumed density structure and gravity anomalies. Thus the latest depth computation of the dive is 35,805 feet. To this figure should be added the height of the pressure sensor above the bottom when the Trieste was at rest on the bottom. The greatest uncertainty in this figure of 35,805 feet is probably in the value adopted for gravity. The gauge reading may be considered reliable to  $\pm 5$  fathoms ( $\pm 30$  feet).



# FOREIGN

## International

CONCURRENT OAS AND FAO  
CONFERENCES ON AGRICULTURE

### SIGNIFICANT FACTORS IN FISHERIES DEVELOPMENT:

Development of fisheries in Latin America was a topic of discussion at the Concurrent Organization of American States and the Food and Agriculture Organization Conferences on Agriculture in Mexico City, August 8-20, 1960. This was the Fifth OAS Conference on Agriculture and the Sixth FAO Regional Conference for Latin America.

The discussion of the development of fisheries revolved primarily around three proposals that had been submitted and which were approved. These were:

1. A Mexican proposal to encourage countries to establish agricultural fish-cultural services to convert inland waters into new sources of food supply.
2. A Mexican resolution recommending that the Governments pay more attention to fishery administration and research, to take into consideration the facilities of FAO and OAS, and that the Directors of FAO and OAS give the greatest possible attention to international conferences, seminars, and scholarships in the fishery sciences and especially to fishing administration.
3. A Panamanian recommendation to establish in Panama, in cooperation with other Governments of the region, a regional fishery institute to undertake studies, investigations, experiments, training, and extension in all branches of fisheries. This proposal asks the Director-General of FAO to assist the interested Governments in requesting money from the United Nations Special Fund for financing and for the preparation of plans for the institute.

## EUROPEAN COMMON MARKET

### EFFECTS OF EEC AND EFTA ON SCANDINAVIAN FISHERIES:

Speaking at the Nordic Fisheries Conference, held in Karlskrona, Sweden, August 16-18, 1960, the Danish Fisheries Ministry declared that development of the European Economic Community or Common Market (EEC) and the European Free Trade Association (EFTA) posed many new problems for the European fishing industry. However, he continued, the interests of the Scandinavian countries were so closely identified that they should be able to pursue the common policy necessary to insure satisfactory competitive conditions for their fisheries.

The Minister focussed his attention on marketing problems in the new European economic area organizations, while pointing out that combined fish exports from Denmark, Iceland, Norway, and Sweden during 1959 totaled about 100 million Danish kroner (US\$14.5 million) more to EFTA than to EEC customers. He listed as the principal problems: (1) the relationship of Finland and Iceland to the market formations; (2) a satisfactory solution within EFTA of the fresh fish question; and (3) the accommodation of Scandinavian export interests within EEC, where tariff and quota restrictions loom especially large and where, moreover, internal fishery policy has not yet been determined.

Without attempting to offer definitive solutions to these problems, he did point out that the expected general expansion of trade within EFTA should have a wholesome effect on the trade in fish products, regardless of whether or not tariffs are eliminated on fresh fish and related items. The direct advantages to be derived from the Stockholm Treaty, he continued, are that tariffs and quotas will be gradually removed for canned fish, frozen fillets, fish oil, fish meal, and fish solubles, always allowing for the possibility that this might backfire against Sweden and Denmark, to the added advantage of Norway. Denmark itself can expect a substantial increase in imports of canned fish, the only fish product on which a Danish duty is imposed at present. Portugal will probably supply a large portion of this increase, with higher grades of canned fish coming from Norway and Sweden, the latter especially furnishing herring in other than airtight containers.

With regard to opportunities afforded Scandinavian fisheries for expansion in EEC markets, the Minister asserted that there are powerful elements within the EEC countries striving for protectionism and self-sufficiency in fishery production. At the same time, however, there are circles within these countries which understand clearly the foolishness of such a policy and see the greater benefits of a common European fishing policy and free trade, such as have hitherto been striven for in negotiations within the Organization for European Economic Cooperation.

We must hope, he concluded, that the liberal forces will prove to be the most influential within EEC and will prevent the adoption of restrictive fishery policies. However, the EEC tariffs which will become effective on January 1, 1962, do not reflect a particularly liberal attitude but on the contrary contain certain duty increases which might have an appreciable effect on some exporting countries.

## International (Contd.):

At the subsequent annual meeting in Copenhagen of the Danish Fish Trade and Ocean Fishery Association, the organization's president predicted that the formation of the EEC would force Danish fishermen to bear the cost of a heavy duty on fish exported to West Germany, thus cutting in to the fishermen's profits. He saw little hope for effecting a downward revision of the duty by bringing the matter before GATT.

Speaking at the same meeting, the Danish Fisheries Minister was less pessimistic about the ability of Danish fishermen to find profitable markets for their catches. And he asserted that the German marketing problem would not have been completely solved had Denmark refrained from joining the EFTA or even had she joined the EEC. (United States Embassy, Copenhagen, September 15, 1960.)

## EUROPEAN FREE TRADE ASSOCIATION

IMPORT TARIFFS REDUCED:

On July 1, 1960, seven countries in Western Europe reduced by one-fifth their protective import duties on practically all the industrial products coming from each other.

At the same time insofar as these seven countries still limit imports from each other by "quota" or quantitative import restriction, these quotas are being relaxed to allow 20 percent more trade.

It is proposed that, by 1970 there will be free trade in the goods covered by the Convention of the European Free Trade Association. The full membership makes up a single market with a population of 90 million. The seven countries (Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom) are among the most important international traders, and these are interesting facts about them:

1. Three-fifths of their foreign business is outside Europe altogether. In the case of Britain 75 percent or more of her trade is outside Europe; 50 percent of her total trade is with her Commonwealth partners.
2. The seven countries do about a quarter of their business with the European six, or European Common Market countries (Germany being their main trading partner).
3. The seven countries enjoy a higher average standard of living than the rest of Europe.

The high living standards of the 90 million people in the EFTA have been established by the importation of goods; for these countries are not endowed by nature to be self-suffi-

cient. Their strength has been built up by buying and selling abroad.

The seven countries need foreign goods, and as they prosper through freer trade among themselves, the demand for imported goods will grow.

They are not likely to fall into a protective ring. They are pledged in GATT to consider the reciprocal reduction of tariffs on a world-wide basis. They are ready to find common cause with the other European group--the European Economic Community--in a United Europe, if terms acceptable to both groups can be negotiated.

In the meantime EFTA is going ahead--reducing barriers to trade between its members. (British Affairs, September 1960.)

Note: See Commercial Fisheries Review, July 1960 p. 47.

## FISHING LIMITS

ICELAND-UNITED KINGDOM NEGOTIATE ON FISHING LIMITS:

The Icelandic Ministry for Foreign Affairs announced September 21, 1960, that talks with the United Kingdom on the two-year-old dispute over the Icelandic 12-mile fishing limit were due to open in Reykjavik October 1.

Both Icelandic opposition newspapers greeted the announcement with alarm and predicted disaster. Both papers called for popular manifestations against compromise of the 12-mile limit.

In September, 79 British trawlers were reported to be operating in waters adjacent to Iceland, but outside the 12-mile limit in accordance with the truce being observed by the British fishing industry. (United States Embassy, Reykjavik, September 22, 1960.)

\*\*\*\*\*

BRITAIN AGREES TO RECOGNIZE NORWAY'S FISHING LIMITS:

Britain and Norway on September 29, 1960, announced that they had agreed that British trawlers may fish up to six miles off Norway for the next ten years (ending October 31, 1970), but after that must keep at least 12 miles off the Norwegian coast.

The agreement was concluded in Oslo, but it must be ratified by the Parliaments of



## International (Contd.):

both countries before it becomes final. Until ratification, British trawlers will continue to fish up to 4 miles of the Norwegian coast. The agreement is a compromise between Norway's claim to territorial and fishing limits of 12 miles (from which all foreign trawlers would be excluded) and Britain's refusal to recognize the claim.

Also, the agreement covers the registration and identification of vessels, the marking of fishing gear, and the regulation of fisheries as between different types of vessels. It provides for both parties not to fish in specified areas in certain seasons. The purpose of the rules is to avoid interference with fishing and damage to fishing gear. Rules will apply to the waters off Norway in which United Kingdom and Norwegian vessels are fishing, including the 6-12 mile zone during the transitional period.

Traditionally, the British government has never recognized the right of any other state to prohibit fishing beyond a three-mile limit. Norway was the only country which Britain had conceded could move the fishing limits to four miles.

Under the new agreement, British vessels will be able to fish between six and 12 miles off the Norwegian coast until October 31, 1970. After that, the British trawlers will be barred inside 12 miles of Norway's shore.

Four limited areas in the 6- to 12-mile belt will be prohibited to fishing vessels of either Britain or Norway in certain seasons.

The Anglo-Norwegian fishery negotiations took place in Oslo from September 22-28, 1960, and ended successfully.

In reaching this agreement, both sides have had in mind the importance of resolving on a practical basis the problems which will arise in the light of Norway's declared intention to extend the fishing limits around its coasts, and of reconciling, to the greatest possible extent, the interests of the fishing industries of both countries that good relations may be maintained. With this aim it was agreed that as far as possible the agreement should be based on the proposal put forward jointly by the Governments of the United States and Canada at the second United Nations Conference on the Law of the Sea in 1960 and which obtained 54 votes, including those of the United Kingdom and Norwegian Governments.

The enforcement of the rules will be a matter for the fishery protection vessels of both countries acting in cooperation and cases of infringement will be a matter for the flag countries of the vessels concerned to prosecute in their own courts. It has, however, also been agreed that in the 6-12 mile zone during the transitional period, the regulation of the fisheries shall be a matter for the Norwegian fishery protection vessels only, and although they will have no power to arrest United Kingdom vessels, they will be able to collect evidence of any infringements and report them to the United Kingdom authorities.

As soon as acceptance by the respective Governments has been obtained, the agreement will be signed, subject to approval by the United Kingdom Parliament and the Norwegian Storting, as soon as possible. (United States Embassy in London, September 30, 1960.)

## FOOD AND AGRICULTURE ORGANIZATION

MEETING ON FISHERIES  
CREDIT HELD IN PARIS:

Participants from 30 nations attended Food and Agriculture Organization (FAO)-sponsored technical meeting on credit for fishery industries, held in Paris, France, from October 17-22. The meeting was open to all FAO member countries.

More than 60 participants, representing nations as globally diverse as Japan and Peru, considered some 34 papers prepared for the meeting.

The meeting was designed to provide an exchange of views on the solution of problems in the organization and day-to-day administration of government credit programs for fisheries. Special attention was paid to conditions in underdeveloped countries and to how experience gained elsewhere can be usefully applied in organizing credit services in those countries.

The Secretary of the Conference pointed out that the exceptional risks connected with the production and distribution of fish have made it difficult for the industry to obtain private credit on acceptable terms. While the purpose of the meeting was not to discuss whether or not governments should or should not assist fishery industries through extending credit, he said much could be gained by joint study of existing credit policies and operations.

The agenda included the following principal subjects:

1. Objectives of credit policy in developed countries and their implications for the general character of credit assistance.
2. Objectives of credit policy in underdeveloped countries and their implications for the general character of credit assistance.
3. Organizational aspects of fisheries credit schemes.

## International (Contd.):

## 4. Operational aspects of fisheries credit schemes.

## 5. Coordination, review, and appraisal of credit policies.

A list of the papers presented follows:

Sources of Loan Funds for Cooperatives, by FAO Secretariat, based on a study by Miss M. Digby, Secretary, The Plunkett Foundation for Cooperative Studies, FAO Consultant. FIFA/WP/1, in English, French and Spanish.

Government Credit Schemes for Fishery Industries in the Indo-Pacific Region, by FAO Secretariat. FIFA/WP/2, in English, French, and Spanish.

Organization and Management of Credit Cooperatives, by FAO Secretariat, based on a study by Miss M. Digby, Secretary, The Plunkett Foundation for Co-operative Studies, FAO Consultant. FIFA/WP/3, in English, French, and Spanish.

Government Credit Facilities for Fishermen in Madras State, by P. I. Chacko, Deputy Director of Fisheries, Madras State, India. FIFA/WP/4, in English.

Le Régime des Bonifications d'Intérêt en faveur de l'Armement et Le Crédit maritime mutuel en France, notices presentées par la Direction des Pêches maritimes, Marine marchande, Paris. FIFA/WP/5, in French.

Le Crédit à l'intention des Industries des Pêches dans la République togolaise, Commentaires sur l'Ordre du Jour par M. R. Desport, Vétérinaire-Inspecteur, Service de l'Elevage et des Industries Animales, Lomé. FIFA/WP/6, in French.

Sources of Credit for Fishery Industries in Denmark, by B. Dinesen, Fisheries Secretary and Chairman of the Board of the Royal Danish Fisheries Bank, Copenhagen. FIFA/WP/7, in English.

Government Credit Facilities for Fishermen in Bombay State, Comments on the FAO Draft Agenda by C. V. Kulkarni, Director of Fisheries, Bombay, India. FIFA/WP/8, in English.

Credit Facilities for the British Herring Industry, by H. H. Goodwin, General Manager, Herring Industry Board, Edinburgh. FIFA/WP/9, in English.

Note on Fishery Credit Schemes in West Bengal, by K. C. Saha, Director of Fisheries, West Bengal, India. FIFA/WP/10, in English.

Le Crédit à l'intention des Industries des Pêches au Portugal, Projet de Réponse aux Questions à l'Ordre du Jour, par le Capitaine de Frégate Renato Sequeira de Brito, Cabinet de Estudos das Pescas, Lisbonne. FIFA/WP/11, in French.

Government Financing of the Fishing Industry in the United States of America, by C. Eldred Peterson, Chief, Branch of Loans and Grants, Bureau of Commercial Fisheries, U. S. Department of the Interior. FIFA/WP/12, in English.

Le Crédit dans la Pêche belge, par P. Hovart, Secrétaire du Conseil professionnel de la Pêche, Ostende. FIFA/WP/13, in French.

An Examination of Arguments for Special Credit Policies for Fishing Industries, by J. Wiseman, London School of Economics and Political Science, FAO Consultant. FIFA/WP/14, in English, French, and Spanish.

Credit Assistance for the Promotion of Fish Marketing in the Federal Republic of Germany, by Dr. Hans Wilhelm Kurjo, Secretary of the Förderungsdienst für den Fischabsatz G.m.b.H., Bremerhaven. FIFA/WP/15, in English.

The Structure of Fisheries Finance in Japan, by Kohei Teshima, Data and Statistics Section, Fisheries Agency, Tokyo. FIFA/WP/16, in English.

Credit for Fishery Industries in the Netherlands, by Drs. G. J. Lienesch, Director of Fisheries, Ministry of Agriculture and Fisheries, The Hague. FIFA/WP/17, in English.

The Fisheries Development Corporation of South Africa Limited, Its Establishment, Functions and Operations, by Cecil von Bonde, General Manager, and W. H. Stoops, Secretary. FIFA/WP/18, in English.

The Economic and Social Effects of Public Credit in the Fishing Industry of Jamaica, by A. J. Thomas, Fisheries Officer, FIFA/WP/19, in English.

Le Crédit destiné aux industries des Pêches belges, par R. H. M. de Graef, Secrétaire d'Administration, Administration de la Marine et de la Navigation Intérieure, Belgique. FIFA/WP/20, in French.

Proyecto para la administración de un fondo de empréstitos destinado a la concesión de créditos para pequeños pescadores, presentado por el Banco Central del Ecuador. FIFA/WP/21, in Spanish.

Reglamentaciones vigentes relacionadas con el otorgamiento de créditos para la industria pesquera por parte del Banco Industrial de la República Argentina, y del Banco de la Nación Argentina, presentado por la Dirección General de Pesca de la República Argentina. FIFA/WP/22, in Spanish.

Organization of Credit and Finance in the Fish Industry of the Federal Republic of Germany. FIFA/WP/23, in English.

Pilot Experiment in Changing the Mode of Credit in a Marine Fishing Village, by G. N. Mitra, Director of Fisheries, Orissa, India. FIFA/WP/24, in English.

The Provision of Credit to Fishermen in Uganda, by A. D. Grimmer, Assistant General Manager, Uganda Credit and Savings Bank, Kampala. FIFA/WP/25, in English.

Fishery Credit in Japan, by Shinkichi Katayanagi, President, National Federation of Fisheries Cooperative Associations, Tokyo. FIFA/WP/26, in English.

Economic Information needed for Fishery Loan Policy Considerations, by Walter H. Stolting, Chief, Branch of Economics, Division of Industrial Research, Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior. FIFA/WP/27, in English.

Small Boat and Gear Insurance for Canadian Fishermen, by I. S. McArthur, Chief Administrator, Fishermen's Indemnity Fund, Department of Fisheries, Ottawa, Canada. FIFA/WP/28, in English, French, and Spanish.

## International (Contd.):

Institutional Lending to the Icelandic Fish Industries, by Gudmundur B. Olafsson, Chief of Administration, Iceland Bank of Development. FIFA/WP/29, in English.

A Fishery-Economist's View on Public Credit for Fishery Industries, by A. G. U. Hildebrandt, ec.drs., Chief Fisheries Division of the Agricultural Economics Research Institute, The Hague, Holland. FIFA/WP/30, in English.

Credit Aid for the British White Fish Industry, by E. S. Holliman, Assistant Chief Executive, White Fish Authority, London. FIFA/WP/31, in English.

The Operation and Administration of Credit Schemes in the British White Fish Industry, by E. S. Holliman, Assistant Chief Executive, White Fish Authority, London. FIFA/WP/32, in English.

Statistical and Economic Review of the Credit Aid Schemes in the White Fish Industry in Great Britain, by E. S. Holliman, Assistant Chief Executive, White Fish Authority, London. FIFA/WP/33, in English.

Finance to the Fishery-Industry in the Netherlands, by Drs. R. G. E. Vissers, National Herstel Bank, The Hague. FIFA/WP/34, in English.

\*\*\*\*\*

# PLAN TO STANDARDIZE NAMES OF MEDITERRANEAN FISH:

The first attempt to standardize the names of fish in order to make fishery statistics comparable among Mediterranean countries has been undertaken, in the form of an illustrated draft catalogue issued by the Food and Agriculture Organization (FAO). The catalogue, containing the names of fish of commercial importance in the Mediterranean, was distributed to members of the General Fisheries Council for the Mediterranean (GFCM) when the council met in Rome, September 22-28, 1960.

The book contains sketches of 250 fish, with their chief characteristics, species, order, and family. Wherever possible the fish's common name has been given in each of the languages of the 12 GFCM member nations.

The need for a catalogue became evident when Mediterranean fisheries experts found they had difficulty in interpreting national statistics for publication, since the same fish was often designated under different names. Some fish were not named at all. This made the assessment of catches and their commercial value extremely difficult.

For instance, the sturgeon is simply known as "sturgeon" in English and is untitled or may be known by a multiplicity of names in Egypt, Israel, Tunisia, and Turkey, as far as FAO's Fisheries Division can determine. The name of a particular type of sole exists in Italian, but is unavailable in the languages of the other 11 Mediterranean nations, although the fish probably exists in the waters off these countries.

The catalogue lists all fish of commercial importance in the Mediterranean--such as the sea horse--

and not just fish that are edible. The sea horse is currently in vogue for use in costume jewelry.

Fish such as herring, cod, haddock, coalfish, and halibut, not caught in the Mediterranean but found in Mediterranean markets, are listed separately in the catalogue. Eighteen kinds of rays, beginning with the guitarfish and ending with the devilfish, are listed. Twenty-eight types of sharks, from the "Darkie Charlie" to the six-gilled shark, are depicted in the book.

The catalogue is so bound that its pages may be removed and filed according to the language classification of each Mediterranean country.

## GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN

### TWO NEW FISHERY PROJECTS URGED BY COUNCIL:

Two projects requiring special financial support by member countries and calling for studies by the Food and Agriculture Organization (FAO) were recommended on September 26, 1960, by the utilization committee of the General Fisheries Council for the Mediterranean (GFCM). The committee's recommendations, which were subject to approval by the GFCM at its plenary session on September 28, 1960, deal with standardizing fish packing and tuna preservation.

The group said that it is extremely advisable to standardize fish packing in all of the 12 GFCM member countries. It suggested that FAO undertake a study on the international standardization of fish packing, based on a limited number of boxes with specific dimensions and built for a specific species of fish. The member countries would contribute to the study by making their experts available and by special financial support.

It was also suggested that FAO begin a study of tuna preservation using the GFCM country that offers the best possibilities for the study. The investigation would deal with both the supply of raw material and with manufacturing. The other member countries would supply data to aid the experiments and also contribute special financial support.

In outlining part of the program for the GFCM's Seventh Session, to be held two years hence, the utilization committee drew the attention of the Council members to developing fish-meal production for human consumption. It also suggested standardizing the process of manufacturing semipreserved fish with special regard to the European Common Market.

### International (Contd.):

The recommendations of the utilization committee, as well as recommendations from the four other GFCM committees, will be used by the GFCM to draw up its program of work for 1960-62.

Delegates present at the Sixth Session of the GFCM represented Spain, France, Monaco, Italy, Yugoslavia, Greece, Turkey, Tunisia, Morocco, Israel, and the United Kingdom (Malta), plus an observer from Libya and observers from nine international organizations.

\* \* \* \* \*

### CANNING AND MIGRATION STUDIES OF MEDITERRANEAN TUNA PLANNED FOR 1961-62:

An international attempt to improve the tagging and canning of Mediterranean tuna has been mapped out for action by the General Fisheries Council for the Mediterranean (GFCM) during the next two years.

The Council, after ending its sixth session held in Rome at the Food and Agriculture Organization (FAO) headquarters, adopted recommendations and resolutions put forward by its five working committees. Among them were resolutions calling for joint action in the field of tagging tuna, an oceanographic survey of the eastern part of the Mediterranean Sea, and a study by FAO of technical problems related to canning tuna.

The Council secretary said that the wealth of tuna known to inhabit the area is likely to provide a great deal more food fish for the consumer and more income for the producer if there is a concerted effort towards rational exploitation.

The program would involve financial support from the GFCM member countries, and participation of the members in providing data necessary to proceed with experiments and research; one country would be chosen as the site of the canning studies.

The tuna program was part of the 1961-62 work schedule adopted by the Council. Also included were several projects to be undertaken with FAO assistance and with special financial support from GFCM member countries.

The Council voted to undertake tagging tuna in the Mediterranean in cooperation with an FAO world meeting on tuna and related species to be held in 1962. Council members would circulate information on their tagging programs and return tags to all institutes involved in the program. It agreed to establish an over-all research program on tuna, based on oceanographical and biological information.

The Council also asked for the assistance of FAO's Fisheries Division in testing and introducing new techniques for finding and catching fish and in standardizing fish packing. These programs would require assistance by experts from the member countries plus special financial support.

The group voted to draw up a catalog of names of molluscs and crustaceans found in the Mediterranean and a catalog listing freshwater fish found in the Mediterranean area.

### GREAT LAKES FISHERIES COMMISSION

#### CANADA APPOINTS NEW COMMISSIONER:

The Canadian Minister of Fisheries has announced the appointment of Dr. J. R. Dymond as one of the Canadian Commissioners administering the Great Lakes Fisheries Treaty.

Dr. Dymond's appointment was made to fill the vacancy caused by the death of Dr. Harkness.

### INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

#### INDUSTRY PROBLEMS OUTLINED AT PARIS CONFERENCE:

The President of the International Association of Fish Meal Manufacturers, speaking at the first annual conference held in Paris, France, September 27-30, 1960, outlined some of the problems facing the fish-meal and oil industry. He stated:

"The outstanding problem which has produced a crisis in the industry in many countries is the fall in world prices due to overproduction and this transcends in importance any other problem, because without prosperity no section of the industry can function properly. In particular is this so with regard to scientific research where progress in techniques and improvements can be seriously affected.

"Everyone here knows what has happened. There is no need to elaborate on it and we are all wondering what is going to happen next.

"Whole industries have ceased functioning, with all the effects that this has had on ancillary industries such as boat building, engineering, ice factories, transport, etc., with the result of unemployment and personal hardship as well as financial loss.

"All fish meal producers have been seriously affected—some of those who fish for fish meal find themselves unable



## International (Contd.):

to pay the fishermen their usual prices for fish and some have had to reduce prices or cut production altogether. Those countries who use fish offal almost entirely have had to reduce their prices to the fish trade so that in both cases the fishing industry of the country is affected.

"The majority of countries have, however, experienced bad times in the past and they have sufficient financial resources by way of reserves or because of the general prosperity of the fishing industry in their country to weather this storm. Obviously the countries who depend solely on offal will continue to produce. The fishing trade of their countries must give them the offal even if necessary without payment.

"It is not impossible to suppose that the governments concerned will cease to remain passive in the light of the threat to the prosperity of these basic industries and will take steps to give protection.

"Discussions among the fish-meal producing countries, so that each can have a fuller appreciation of the others problems will be of considerable value. The whole subject is so complex and in a condition of continual change that it cannot be otherwise than useful to have all the information available.

"For a moment let me remind you of some of the conditions which have led to the present state of the market:-

"The sudden extraordinary rise in production without a corresponding increase in demand.

"Accumulation of stocks.

"Inefficient marketing, i.e. lack of a well-thought-out system of distribution and marketing designed to protect both producers and buyers.

"Substantial quantities of fish meal being produced of poor quality.

"Reports in certain cases that contracts are not being properly fulfilled, with the result that buyers are involved in heavy losses and with the resulting lack of confidence in future business.

"Continued price cutting, the result of overproduction and excessive competition.

"Speculation by large and small people, which has been the cause of heavy losses.

"With regard to overproduction there is no magic formula for the industry or for any of our countries which will put things right. Personally, I feel that each country must endeavor to work out its own solution and it may be that eventually some sort of plan may be evolved on which the association can take a hand, but one thing that we cannot do is to interfere unasked in any country's business affairs. All that we can say is that amongst the members of this association there is considerable experience, which is at the service of the entire industry.

"I would suggest consideration of two things:-

"1. Improvement in standard of quality.

"2. Consideration of some form of International Contract.

"With regard to the first, quality is of the utmost importance to the farmer and compounder. Only a very small percentage of the ration is supplied by fish meal and buyers will not grudge a reasonable premium for quality.

"If, therefore, we can give the buyer any additional guarantee to the usual chemical analysis of protein, oil and minerals, then we should do so. I am thinking principally of digestibility.

"I would like to ask our scientific advisors how far they think we can go in giving additional guarantees and I suggest that manufacturers should concentrate on producing a top-grade fish meal on which buyers could rely for quality and manufacturers should take all steps possible to see that second-grade fish meals do not compete with first grade, but are segregated for other uses or carefully marketed where they would not affect the marketing of top-grade quality fish meal.

"With regard to consideration of some form of international contract, if it were possible to have one form of contract only, I feel that it would help marketing and help stability of prices, but I do not mean to imply doubts on old established contracts such as are used today. I did, however, refer previously to lack of confidence because of the losses which were caused by bad performance of contracts and it is this that I have in mind in suggesting that something be done to tighten up contracts, so that buyers can place more reliance on them.

"I feel that this Association should have all the support which manufacturers throughout the world can give it. . . ." (Fisheries Council of Canada, *Bulletin*, October 3, 1960.)

## INTERNATIONAL CONFERENCE ON FISH IN NUTRITION

UNITED STATES FISHING INDUSTRY  
PLEDGES SUPPORT TO CONFERENCE:

Various segments of the United States commercial fishing industry, meeting in Washington, D. C., have pledged their support in making the coming world nutritional fishery conference a success, the U. S. Department of the Interior reported on October 19, 1960.

The conference will be held in Washington, D. C., September 19-27, 1961, under the auspices of the Food and Agriculture Organization (FAO). It will be officially known as the International Conference on Fish in Nutrition. About 400 representatives from more than 50 nations are expected to attend.

A suggested agenda for the conference is being prepared by the Food and Agriculture Organization. Speakers will include some of the world's leading scientists in this field. Numerous other arrangements for the meeting will be handled by the U. S. Bureau of Commercial Fisheries.

Initial steps for the conference were taken last year when the United States delegation to the Tenth Food and Agriculture Organization Conference in Rome urged the calling of such a meeting. The State Department accepted the invitation of the FAO for the United States to be the host country.

The fundamental purpose of the meeting is to assemble the scattered information on the nutritive value of fish, to assess this information, and to stimulate future scientific investigation on this food source.

One result would be to delineate the role of fish and fishery products in adding to the supply of protein foods in both developed and underdeveloped areas of the world.

Other objectives are to stimulate international exchange of information pertaining to fish as a food and to prevent needless duplication of research; to provide the basis for future conferences on more specific aspects of the nutritional value of fishery products; to provide technical and economic information on available marine food resources to combat present world-wide nutritional deficiencies and to meet future expanded world food needs; to provide information on present world production and utilization of fishery products and to determine factors that may enhance the availability and utilization of these products.

The conference will consider the nutritive aspects of fish and fishery products both as they pertain to human needs and to use in animal feed. It will be a scientific meeting with scientists from many nations, drawn from the industry, educational institutions and government, presenting reports.

## International (Contd.):

Main topics which are being considered include such things as the role of fish in world nutrition, the chemical composition of fish and fishery products, contribution of fish and fishery products to the diets of various nations; fishery products in animal nutrition; possibilities for increasing fish consumption.

Under such main titles would be reports on the amino acid composition of the protein in fishery products; fats, oils, and related components; food values of fresh fish compared with processed fishery products; minerals and vitamins in fish; incidence of malnutrition, by regions; fish in dietetics, including geriatric diets; utilization of fish flour; fish proteins and their importance in preventing malnutrition; fish derivatives in feed for swine, calves and poultry, and for fur bearing animals; economic and social incentives for increasing production; and methods of consumer education.

The Washington meeting of the representatives of several fishery organizations was called by the Bureau of Commercial Fisheries to acquaint the industry with current thinking on program and arrangements and to solicit suggestions and comments. The group expressed itself generally in favor of the proposed program and made several suggestions regarding it.

Bureau officials are working actively with interested groups in the United States to complete recommendations on the subject matter for the conference agenda. FAO will consider these recommendations, and those of the member nations, in preparing the final agenda. Once the agenda is firm, FAO will issue to the world's scientists, active in research that will further the use of fish as food, an invitation for them to offer reports on their work. These reports will be screened by an FAO scientific committee and those of pertinence and high scientific quality will be presented at the conference.

## INTERNATIONAL COOPERATION ADMINISTRATION

### SPONSORS STUDY OF MARINE RESOURCES OFF COASTS OF VIETNAM AND THAILAND:

A study of the marine resources in the Gulf of Thailand and the South China sea, waters which border many countries of Southeast Asia, is being sponsored by the U. S. International Cooperation Administration (ICA) in support of the interest of Thailand and Vietnam in learning more about the seas which border their coasts.

As a result of the ICA sponsorship, the Scripps Institution of Oceanography of the University of California and the George Vanderbilt Foundation at Stanford University have jointly undertaken a marine biological and oceanographic survey of this vast area. The term of the project is for a period of two years with the possibility that it might be extended for some additional period.

The investigations are being conducted by the Scripps research vessel Stranger, a 300-ton, twin screw, motor vessel. Near-shore investigations are being conducted along the Gulf coasts of Thailand and the sea coasts of

Vietnam from smaller boats provided by agencies of the two countries.

Highlights of the Naga Expedition, as it is called, were given in a speech by the Captain of the Stranger at an American Association Luncheon on July 20, 1960, in Bangkok.

A major reason for the project and the basis for its stated objectives is that although the seas adjacent to the borders of Thailand and Vietnam may well be one of their richest natural resources, adequate, systematic investigation and analysis of the scope required has never been accomplished. Principal stated objectives are directed toward but are not necessarily limited to: (a) providing information and scientific basis for the development of marine economic resources of Vietnam and of Thailand; (b) preparation of a well-documented collection of fishes, invertebrates, and marine plant life; (c) preparation of handbooks summarizing the features of marine fauna and ecology in the area and for the identification of marine species of known and potential commercial importance; (d) training of young marine scientists and technicians; (e) encouragement of the marine sciences in the general region; and (f) promotion of the exchange of scientific information in the marine sciences.

Each of these objectives is worthy of a full-scale supporting program, but the major effort should be directed towards carrying out the kind of basic studies which will lead to an understanding of the oceanography of the region, including the circulation, methods of enrichment, primary productivity, and of the nature, distribution, and abundance of the important marine resources. In accomplishing this, it is hoped to recognize and attack one or more specific problems, in the solution of which it is possible to demonstrate the practical application of scientific findings.

## INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

### COLD-WATER FLOW FROM ARCTIC OCEAN INTO NORTHEAST ATLANTIC AFFECTS AREA'S FISHERIES:

Findings of "great value" to fishery research have resulted from the international expedition, completed in mid-1960, which set out to find the overspill of cold "heavy" water on the ridge between the Faroe Islands and Iceland.

## International (Contd.):

A scientist from the Marine Laboratory, Torry, Aberdeen, who organized and led the expedition, stated on his return to Aberdeen last week that it was "a magnificent example of international cooperation."

Survey ships of five nations--Britain, Russia, Germany, Norway, and Iceland--took part in the three-weeks survey.

The head of the hydrographic section at Torry, used the Laboratory's research vessel *Explorer* as flagship, and the research ships of the nations kept in radio contact with each other during the three weeks.

The objective was to try to trace the overspill of cold "heavy" water from the deep Arctic into the Northeast Atlantic, which is believed to have highly important after-effects on Northwest European fisheries.

The idea was to carry out a survey on each of the three weeks so that the overspill might be traced and measured. The scientists would have felt that their efforts had been rewarded had they found the overspill but once.

Instead they located it on every occasion, and a great deal of valuable data was collected with instruments operated to the depth of 2,500 meters (8,200 feet).

This "overspill" is believed to affect the flow of nutrient salts in deep oceanic waters, these salts being fertilizers of the marine vegetation on which fish feed. White fish are dependent on this continental shelf for their food and the expedition was, therefore, concerned with the question of the fertilization of the region, which is about 200 miles wide.

"We made a survey three times, with a week's interval between," the British scientist stated.

He produced charts at a press conference to show how successful the scientists had been in gauging the extent and direction of the overspill.

The expedition was sponsored by the International Council for the Exploration of the Sea and the British scientist is chairman of the council's hydrographic committee.

## INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

## SEVENTH ANNUAL MEETING IN BRITISH COLUMBIA:

The Seventh Annual Meeting of the International North Pacific Fisheries Commission was held in Vancouver, British Columbia. The Commission, composed of representatives from Canada, Japan, and the United States, held its formal opening session on November 7, 1960. The week-long plenary sessions of the Commission were preceded by three weeks of meetings of a number of scientific and technical committees.

The Commission, established in 1953, is responsible for developing solutions, on a scientific basis, for fishing problems which arise between the three countries in the high-seas areas of the North Pacific Ocean.

Under the terms of the North Pacific Treaty, Japan has abstained from fishing salmon, halibut, and herring along the North American coast. Canadian fishermen also abstain from fishing salmon of United States origin in the Bering Sea. In order for a stock of fish to qualify for continued abstention, it must be demonstrated that it is being fully and scientifically exploited and properly conserved by the countries which are allowed to continue to fish. The Commission is required to review the conditions for abstention each year and to determine whether or not the stocks in question continue to qualify. The abstention questions, with their broad background of research and scientific information, occupied a major part of the Commission's attention at this annual meeting.

The Commission also concerned itself with studies of the proper location for the dividing line for salmon fishing. At present Japan refrains from fishing for salmon east of a line which runs north and south along the 175th west meridian, some 2,000 miles west of Vancouver. An extensive research program has been carried out to discover whether or not this line most equitably divides salmon of Asian and North American origin.

At the present meeting, action on confirmation or adjustment of the dividing line depended in part on whether or not the Commission received from its sponsoring governments an agreed interpretation of the principles on which drawing of the line should be based. At

### International (Contd.):

its 1959 meeting, held in Seattle, the Commission referred this question of Treaty interpretation back to the sponsoring governments and, at the present time, was still awaiting an agreed interpretation.

Strong emphasis was given to the task of analyzing and publishing the great volume of research material which has accumulated from the Commission's investigations on the high seas. These investigations, in which all three countries have taken part, have contributed a tremendous amount of information about the fisheries resources of an area that was largely unknown when the Commission began its work.

Preliminary committee meetings, participated in by many prominent fisheries scientists from each of the three countries, were held in Nanaimo during the week of October 17, at Harrison Hot Springs during the week of October 24, and in Vancouver during the week of October 31.

Four Commissioners represented each of the member nations. They were accompanied by staffs of advisors and experts, bringing the total number of participants in the meeting to approximately 100. Observers from a number of other international fisheries organizations and from the U. S. S. R. were expected to attend the sessions.

The United States delegation was led by Commissioner Milton E. Brooding of San Francisco with fellow-Commissioners Edward W. Allen of Seattle, John H. Clawson of Anchorage, Alaska, and Arnie J. Soumela, Commissioner of the United States Fish and Wildlife Service.

Experts and advisors accompanying the United States delegation included Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, Washington, D. C.; W. C. Herrington, of the U. S. Department of State, Washington, D. C.; Dr. J. L. McHugh, Chief, Division of Biological Research, Bureau of Commercial Fisheries, Washington, D. C.; C. L. Anderson, Commissioner of Fisheries of Alaska; Milo Moore, Director of Fisheries, State of Washington, R. W. Schoning, Director of Fisheries, State of Oregon; R. S. Croker, Chief, Marine Fisheries Branch, California State Department of Fisheries; C. E. Atkinson, Director of the Biological Laboratory of the U. S. Bureau of

Commercial Fisheries, Seattle; and Dr. W. F. Royce, Director of the Fisheries Research Institute, University of Washington. A number of scientists and industry advisors from Alaska, the Pacific Coast States, and Washington, D. C., accompanied the United States delegation.

### ITALY-YUGOSLAVIA RENEW FISHING AGREEMENT

On August 16 in Belgrade, Yugoslavia, representatives of the Italian and Yugoslav Governments agreed to renew a fishing agreement regulating the fishing rights in the Adriatic. The original accord was signed in November 1958 and has been in effect since that date. The renewal makes no change in the existing provisions, will take effect on September 1, and will be valid for eighteen months. (United States Embassy, Rome, August 26, 1960.)

Note: See *Commercial Fisheries Review*, February 1959 p. 40.

### WEST EUROPEAN FISHERIES ORGANIZATION

#### WEST EUROPEAN FISHERY COMMUNITY PROPOSED:

The West European Fisheries Organization held its annual convention in Hamburg on September 15 and 16, 1960, attended by delegates from Sweden, Norway, Denmark, England, Holland, Belgium, France, Portugal, and West Germany. Discussions centered around proposals by the British Trawler Association for the establishment of a West European Fishery Community.

The Fishery Community would create a link between the European Economic Community and the European Free Trade Association. Its goals would include the establishment of a common fish market, common access to all fishing grounds, the appointment of authorities to ensure adherence to existing fishing conventions, and the preservation of fish stocks. Finally, the West European Fishery Community would be designed to promote sound development of the fishing trades of the contracting parties and, if possible, agreement upon a common external tariff.

The delegates also discussed possibilities for preserving present territorial fishing limits and the detrimental effects of Peruvian fish meal exports on their national fisheries. They stated their desire to have the Northeast Atlantic Fisheries Convention of 1959 ratified as soon as possible.



## International (Contd.):

## WHALING

## ANTARCTIC WHALE CATCH FOR 1959/60 SEASON EXCEEDS QUOTA:

Contrary to earlier reports, the catch of baleen whales in the Antarctic for the 1959/60 pelagic season was over, not under, the ceiling catch of 15,000 blue-whale units fixed by the International Whaling Commission. The catch totaled 15,510 units as compared with 15,235 units taken in the 1958/59 season.



Table 1 - Antarctic Whaling Fleets and Production, 1958/59 and 1959/60

Season	Fleets	Catchers	Baleen Whales	Oil	Sperm Whales	Oil
				Long Tons		Long Tons
1959/60	20	217	32,214	309,343	4,165	32,015
1958/59	20	235	30,824	269,741	5,451	42,032

During the 1959/60 season the Netherlands and Norway operated outside the International Whaling Convention from which they withdrew in 1959, after the five nations which participate in Antarctic pelagic whaling had failed to agree on national quotas within the ceiling.

The 32,214 baleen whales taken last season comprised 26,412 fin, 3,234 sei, 1,338 humpback, and 1,230 blue whales.

## COMMISSION MEETS IN LONDON:

Research programs and management practices covering the world's whale populations, with particular reference to the Antarctic region stocks, were thoroughly reviewed at the twelfth meeting of the International Whaling Commission, London, England, June 20-24.

Represented at the meeting were the governments of Argentina, Australia, Canada, Denmark, France, Iceland, Japan, New Zealand, South Africa, Sweden, the U. S. S. R., the United States, and the United Kingdom. Argentina acceded to the Convention on May 18, 1960. There were also present observers from the Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, Norway, the Netherlands, Italy, and Portugal.

The Commission was addressed by the Parliamentary Under-Secretary of State for Scotland in the United Kingdom Government, who pointed out that the growing need for the conservation of marine resources had been given world recognition in recent years. Two of the world's leading whaling nations--Norway and the Netherlands--had withdrawn from the International Whaling Convention as a result of failure outside the Convention to rationalize the fishing efforts of the countries participating in Antarctic pelagic whaling. Nevertheless discussions on the harmonization of claims were continuing outside the Commission and their success was earnestly hoped for.

Although Norway and the Netherlands were no longer party to the Convention, catch limits

Table 2 - Antarctic Pelagic Whaling, 1960

Country	Fleets	Catchers	Baleen Whales	Oil (Bbls./1/)	Bbls. Per Blue-Whale Unit	Sperm Whales	Oil (Bbls.)
Norway . . . . .	8	70	9,246	588,450	128.9	1,430	63,438
Japan . . . . .	6	69	10,959	551,255	105.7	1,398	65,876
United Kingdom .	3	31	3,983	237,420	124.9	454	20,360
U. S. S. R. 2/ . . .	2	34	5,988	337,903	121.2	840	40,397
Netherlands . . .	1	13	2,038	141,031	135.9	43	2,019

1/6 barrels of oil equal one long ton or 2,240 pounds.

2/The U.S.S.R. catch excludes 203 minke and 55 killer whales.

Official results of the 1959/60 season, as compiled by the Committee of International Whaling Statistics at Sandefjord, Norway, and subject only to final adjustment are shown in table 2. (Australian Fisheries Newsletter, July 1960.)

\*\*\*\*\*

for their fleets had been set for the 1959/60 Antarctic season. The three Antarctic pelagic whaling countries remaining party to the Convention had operated within the ceiling of 15,000 blue-whale units, which was the maximum permitted catch established by the Commission for whaling in the Antarctic. Within that ceiling, Japan and the United Kingdom

## International (Contd.):

had set limits for their fleets; the agreement between the five Antarctic pelagic whaling countries which had been sought outside the Commission would have allocated 20 percent of the total permitted catch for the U. S. S. R. The Commission is empowered to determine the size of the Antarctic pelagic whaling quota, but not how it is split up between the floating factory expeditions.

During the 1959/60 season 20 expeditions from these five countries operated in the Antarctic and caught a total of 15,433 blue-whale units in a season lasting 99 days, compared with 69 days in the three preceding seasons. This figure comprised 1,230 blue whales, 26,415 fin whales, 1,338 humpbacks, and 3,234 sei whales. The total catch in the 1958/59 season had amounted to 15,301 blue-whale units, composed of 1,191 blue whales, 25,837 fin whales, 2,394 humpbacks, and 1,402 sei whales. A total of 4,173 sperm whales was taken by all the Antarctic pelagic expeditions in the 1959/60 season as compared with 5,451 in the previous season. The 1959/60 Antarctic pelagic whaling season produced 2,048,159 barrels of baleen and sperm oil; in the previous season the yield was 2,052,010 barrels.

Antarctic land stations in 1959/60 caught 757 blue-whale units, compared with 807 the year before; the sperm whale catch was 89 against 215 in 1958/59. The oil production was 97,673 barrels, about 5,000 less than the previous year.

Outside the Antarctic, 47 land stations and three floating factories were in operation in 1959. A total of 21,500 whales was taken, compared with 24,700 in 1958. The production of whale oil amounted to 326,700 barrels (at six barrels to the ton), about 12,000 barrels more than in 1958, but the production of sperm oil at 343,400 barrels was some 59,000 barrels less.

The unsatisfactory position arising from the withdrawal from the Convention of two of the five Antarctic pelagic whaling countries occupied much of the Commission's attention. A resolution was finally adopted appealing to the Netherlands and Norway to rejoin the Convention in the interests of effective conservation action, which should include an arrangement for the sharing of the total catch and the introduction of an international system of inspection.

To assist these purposes the Commission decided by 7 votes against 2 votes with 4 abstentions to suspend for the 1960/61 and 1961/62 seasons the Antarctic blue-whale unit limit. This action was taken with reluctance and on the understanding that if Norway and the Netherlands should not soon rejoin the Convention, the suspension would be revoked.

In this same context the Commission adopted a resolution asking their Ad Hoc Scientific Committee to carry out a detailed and specified program to improve the collection and interpretation of data, including the use of the latest methods of studying animal populations. The Commission also resolved to appoint three scientists in the field of population dynamics and drawn from countries not engaged in pelagic whaling in the Antarctic to assist in the assessment of the condition of the Antarctic whale stocks and in the determination of any measures that would increase the sustainable yield. The three scientists would report to the Commission within a year of their appointment and would work with the Ad Hoc Scientific Committee.

In setting up this special group of scientists, the Commission signified their intention that the Antarctic catch limit should be brought into line with the scientific findings not later than July 31, 1964, having regard to the provisions of Article V(2) of the Convention.

The International Whaling Commission gives effect to the conservation aims of the Convention through amendments of a Schedule to the Convention requiring a three-quarters majority of those present and voting for their adoption.

Apart from the suspension of the blue-whale unit limit, two other amendments were adopted.

The first of these forbids pelagic whaling expeditions from taking humpback whales in the Antarctic sector to the south of West Australia during the next three seasons; while in the Antarctic sector to the south of East Australia and New Zealand the present open season of four days for pelagic whaling for humpbacks is to be reduced for those three seasons from 4 days to 3 days. Australian and New Zealand land stations catch humpback whales belonging to the same stocks that inhabit those Antarctic sectors and the Commissioners of their respective

## International (Contd.):

Governments stated that conservation measures were in force which were reducing the catches made by those land stations.

The second amendment shortens the period during which pelagic whaling expeditions may take blue whales in the Antarctic. The season for taking blue whales there will henceforth open on February 14 instead of February 1 and will end as before on April 7. The purpose of this change is to give additional relief to a species of whale the populations of which are thought by the Commission's scientific advisers to be in an increasingly serious condition. This amendment was adopted without opposition.

The Commission considered the report of an expert Working Party which had been set up after the Eleventh Meeting to study the question of the humane slaughter of whales. It was noted that at present there was no conclusive evidence that killing whales by electrical means was more humane than the present method of the explosive harpoon and that the chief criterion was the speed of killing. There were no other methods likely to prove more humane. There was a prospect, however, of further progress towards the development of a satisfactory and effective electric harpoon, and the Commission agreed with the suggestion of the Working Party, which will continue in being, that to this end there should be consultations at a technical level between representatives of the whaling industries.



## Angola

## FISHERIES PRODUCTION AND EXPORTS, 1958-59:

Fish production in Angola declined during 1959, continuing a trend evident since 1957. Landings dropped from 278,054 metric tons in 1958 to 267,170 tons in 1959. The decrease in sardine landings was the most marked, from 92,185 tons in 1958 to only 44,601 tons in 1959. The mackerel landings were also down about 50 percent. Horse mackerel

landings were up a bit and small horse mackerel landings increased by 50 percent. These are the main species used by the fishing industry to produce fish meal and oil. The spiny lobster landings quadrupled and shrimp landings in 1959 remained about the same as in 1958, both at high levels.

The decline in the industry by fishing centers and species of fish was mixed. The main impact of the lower landings was felt in the Mocamedes fishing area where the catch dropped from 171,829 tons in 1958 to 152,245 tons in 1959. The sardine catch of this port was one-eighth that of the previous year. Fish landings in the Benguela area actually increased from 98,342 to 107,025 tons, but the ex-vessel price received declined from 68,856 to 51,088 contos (US\$2,383,000-\$1,773,000). The Luanda fishing area was the least affected of the major producing areas; it had an average year and benefited from the greatly increased spiny lobster catch. The spiny lobster fishermen there caught 25 tons of lobsters worth 608 contos (US\$21,100), as compared with the previous record catch of 7 tons worth 191 contos (US\$6,600) in 1958. The fishermen of Santo Antonio do Zaire also enjoyed a profitable year, but this area is of little importance to the fishing industry.

The plight of the industry has been caused by decreased fish catches, many uneconomic factories using primitive techniques, and world-wide overproduction of fish meal which has lowered the international price to a level below the Angolan cost of production. Studies were begun during the year which were aimed at a complete reorganization of the industry and a concentration of production on such primary products as dried and canned fish with a de-emphasis on such products as fish meal and oil. At present fish meal is the principal product of the Angolan industry. By the end of 1959 it was apparent to all that

Table 1 - Angola's Production of Processed Fishery Products, 1958-59

Product	1959	1958
(Metric Tons)		
Canned fish	1,264	1,282
Dried fish	23,586	28,332
Fish meal	46,170	47,803
Fish oil	4,859	7,254

Table 2 - Angola's Exports of Fish Meal and Dried Fish, 1958-59

Product	Quantity		Value			
	1959	1958	1959		1958	
	(Metric Tons)		Contos	US\$	Contos	US\$
Fish meal	51,228	81,243	205,620	7,135	289,599	10,021
Dried fish	13,965	16,476	75,900	2,634	90,008	3,114

1/1,000 escudos.

some kind of drastic action was required to assist the industry over its present financial crisis and to begin making preparations to meet the long-term difficulties. First steps in these programs were taken by the government by suspending the collection of income

## Angola (Contd.):

Table 3 - Average f.o.b. Prices for Angolan Fish Meal Exports, 1950-59

Product	Year									
	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950
Fish meal	139.14	123.18	120.76	131.14	139.45	129.07	123.88	112.80	102.77	122.49

Note: Portuguese escudos converted to US\$ at rate of 28.9 escudos equal US\$1 for 1950-58, and 28.82 escudos equal US\$1 for 1959.

taxes from the fishing firms in 1959 and the creation late in December 1959 of the Fund to Support the Fishing Industry. The capital for the Fund was to come from a tax on gasoline sales and an annual subsidy from the Government. It would grant loans to fishing firms. (United States Embassy, Luanda, September 20, 1960.)

\*\*\*\*\*

#### FISH MEAL INDUSTRY TRENDS, FIRST HALF OF 1960:

A price differential or subsidy on fish meal exports was authorized by Angolan Legislative Diploma No. 3054 of August 10, 1960, but this authority had not been exercised up to the end of September 1960.

The "Fund to Aid the Fishing Industry" is empowered to grant to the fishing industries an unspecified amount of money as a subsidy to cover part of the price differential between the international market quotations for fish meal and the local cost of production. This subsidy is a reimbursable, interest-free loan. The power to grant the subsidy is retroactive to July 1, 1960.

Angola's Exports of Fish Meal, January-June 1960					
Country of Destination	Quantity Metric Tons	Value		Average F. O. B. Prices Per Metric Ton	
		1,000 Escudos	US\$ 1,000	Escudos.	US\$
Portugal . . .	5,375	16,508	577	3,071	107.37
Mozambique . .	122	414	14	3,393	118.63
West Germany	755	2,343	82	3,103	108.49
Italy . . . . .	1,891	5,482	192	2,899	101.35
Other . . . . .	1,688	4,745	166	2,811	98.27
Total . . . . .	9,831	29,492	1,031	3,000	104.87

Note: Escudos converted at rate of 28.6 escudos equal US\$1.

The Angolan Government states that subsidy payments have not yet been made. Industry representatives have been led to believe that a differential of US\$10 a metric ton will be paid to them. A Luanda fish-meal producer states that he had recently exported 200 tons of fish meal at a price of US\$75 per metric ton f.o.b. He believes that he will receive the \$10 subsidy from the Government, but considers that since his costs were \$100 per ton he was still losing \$15. Since then prices are said to have im-

proved, a sale allegedly having been made on September 27 for \$92 a ton f.o.b. (United States Embassy, Luanda, September 28, 1960.)



#### Argentina

##### IMPORT SURCHARGES REMOVED ON NEW FISHING VESSELS:

The Argentine Government has issued two decrees governing the domestic shipbuilding industry and the importation of vessels, provisions of which affect the fishing industry. According to Article 1, paragraph b of Decree No. 10,032 of August 26, 1960, new vessels of up to 3,000 metric tons gross weight may be imported free of surcharges for use as fishing vessels or for refrigerated transportation. This exemption from import surcharges will be effective for two years from the date of issuance of the decree. Article 5 of the same decree specifies that no exemption is made for used vessels; the import surcharges remain at 150 percent. The Government will compensate domestic shipbuilders for the loss of these protective surcharges with a subsidy.

Article 5 of Decree No. 10,033 of August 26, 1960, declares that the Government will pay shipbuilders of vessels under 3,000 metric tons gross weight which are to be used as fishing vessels or refrigerated transport a 40-percent subsidy based on the average European cost of such vessels. The complete text of these decrees was published in the Boletín Oficial of September 1, 1960.

For several years the Argentine Government has recognized the necessity of reequipping and expanding the fishing fleets, but until these decrees had been issued nothing concrete had been done to achieve that goal. While the fishing industry awaited eagerly the publication of these decrees, prior to their issuance opinion was divided as to the form they should take. Cannery owners sought only to lower the import surcharges on fishing vessels. Owners of fishing vessels, who in most cases operate their own



## Argentina (Contd.):

boats and upon whom the canneries depend for supplies, opposed the lowering of surcharges without the simultaneous creation of special credit facilities for their use. They claim that only the canneries have sufficient resources to import new vessels. It would appear that the decrees as issued favor the canneries in this dispute. In fact, the surcharges on less expensive used vessels were not lowered. It was such used vessels that the fishermen had intended to purchase. However, it is reported that the Government is studying the creation of special long-term, low-rate credit facilities for the fishermen. (United States Embassy, Buenos Aires, September 21, 1960.)

\*\*\*\*\*

#### FIRST TWO FISHING VESSELS IMPORTED UNDER NEW DECREE:

The first two fishing trawlers to be imported under the recent Argentine decree removing import surcharges from such vessels were due to arrive in the Port of Mar del Plata the week of October 3, 1960, according to press reports. The vessels were purchased by a cannery in Mar del Plata.

The trawlers (Neptune and Mar del Plata) were constructed in Denmark. They are steel-hulled, 25.6 meters (84 feet) in length, and have 350-hp. motors. Reportedly the vessels are equipped with modern electronic equipment, and nylon nets. The holds have a capacity of 1,000 boxes of 50 kilograms each (about 110,000 pounds), according to an October 6, 1960, report from the United States Embassy in Buenos Aires.



## Australia

#### NEW SPINY LOBSTER FISHERY REGULATIONS FOR WESTERN AUSTRALIA:

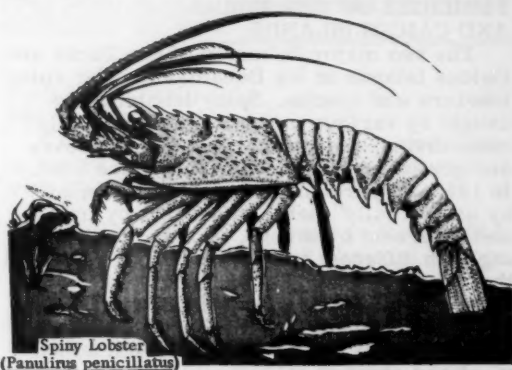
New regulations for the spiny lobster fisheries of Western Australia were published in the Western Australia Government Gazette of May 20, 1960. These suggestions supersede those published June 27, 1958, in the same publication.

(1) Fishermen and boats engaged in the taking of crayfish or spiny lobster between the 30th and 33rd parallels of south latitude

may not during the same calendar year be so engaged anywhere between the 28th and 30th parallels.

(2) Fishermen and boats so engaged between the 28th and 30th parallels may not during the same calendar year be so engaged anywhere between the 30th and 33rd parallels.

(3) Save as mentioned in clauses (4), (5), and (6) hereunder, no restrictions in regard to the operations of fishermen or boats engaged in taking crayfish anywhere between the 28th and 33rd parallels shall be applied in relation to waters north of the 28th parallel or south of the 33rd parallel.



Spiny Lobster  
(*Panulirus penicillatus*)

(4) Fishermen and boats engaged in the taking of crayfish in the Abrolhos Islands area, as defined in clause (5) hereunder, shall not be permitted during the whole of the Abrolhos Islands season to engage in the taking of crayfish elsewhere.

(5) No freezer-boat shall engage in the taking of crayfish in the Abrolhos Islands area, or in the Abrolhos Islands area possess, store, cut up, handle, preserve or treat crayfish or portions of crayfish. The Abrolhos Islands area comprises the whole of the Western Australian waters bounded by lines starting from the intersection of 28 degrees South Latitude and 113 degrees 50 minutes East Longitude and extending southeasterly to the intersection of 30 degrees South Latitude and 114 degrees 40 minutes East Longitude, thence west to 113 degrees East Longitude, thence north to 28 degrees South Latitude and thence east to the starting point.

(6) Freezer-boats shall be permitted to catch crayfish north of the 28th or south of the 33rd parallel and to process their own

## Australia (Contd.):

catch, but shall not be permitted to process crayfish caught by any other boat or person.

(7) Freezer-boats shall be permitted to process crayfish caught by other boats or persons north of the 7th parallel of South Latitude. (Australian Fisheries Newsletter, July 1960.)



## Bahama Islands

FISHERIES OF THE TURKS  
AND CAICOS ISLANDS:

The two major fisheries of the Turks and Caicos Islands in the Bahamas are for spiny lobsters and conchs. Spiny lobsters are caught by various means, including "bully" nets, diving, and traps. The use of spears and grains has been prohibited since 1958. In 1959, 62 percent of the catch was made by using "bully" nets, 30 percent by traps, and 8 percent by divers. Comparative fishing with different traps or pots has indicated that the Jamaica-type traps gave better results in both shallow and deeper waters than the Cuba, Florida, and Honduras types. Most effective bait was two-day-old conch meat and shark meat.

A United States firm has an exclusive export license for frozen lobster tails. Exports have ranged from 35,200 pounds to 128,640 pounds of spiny lobster tails over the last 9 years (average 90,928 pounds). The spiny lobster tails are graded for export into 7 categories, according to weight. They are shipped by air (3 hours flight) in 40-pound cartons, up to 300 cartons per flight, from South Caicos to Miami, where they are loaded into refrigerated trucks for shipment to New York City. An export duty of US\$0.01 a lobster is levied.

The Caicos Islands have for many decades shipped dried conch meats to Haiti. Average shipments between 1941 and 1955 were about 3 million meats, and about 2.2 million meats per year from 1956 to 1959. The dried meats average 3 ounces each and their export value is from 6-8 shillings (US\$0.84-1.12) per 100. While in the past the shells were not utilized, a Florida firm obtained a 3-year export license in 1960 for 500,000 to 750,000 shells per year. An

export duty of US\$0.01 is levied on every 5 shells. Prices paid are 30 shillings (\$4.20) per 100 for large, 21 shillings (\$2.94) for medium, and 14 shillings (\$1.94) for small shells. (West Indies Fisheries Bulletin, May/June 1960.)



## Belgium

CANNED FISH AND SHELLFISH OFFERING  
PRICES TO ANTWERP IMPORTERS:

Canned fish and shellfish importers in Antwerp, Belgium, in early September reported the following c.i.f. offers for imported canned fish and shellfish:

Offering Prices (c.i.f.) to Antwerp Importers of Canned Fish		
Product and Origin	Cans/Case & Contents Weight	Price c.i.f. Antwerp
US\$ Per Case		
<b>Salmon:</b>		
Fancy pink (Japan) . . . . .	48/16-oz.	18.62
Kiltie Fancy Pink (Canada) . . . . .	48/16-oz.	24.67
Keta (chum) (Japan) . . . . .	48/16-oz.	17.64
Delmonte Red (U. S.) . . . . .	48/16-oz.	38.65
<b>Lobster:</b>		
National Banner (Canada) . . . . .	48/6½-oz.	40.69-43.26
	48/2½-oz.	22.44
	24/13-oz.	40.17
<b>King Crab:</b>		
Chatka (U.S.S.R.) . . . . .	96/7-oz.	55.00
Fancy Quality (Japan) . . . . .	48/6½-oz.	28.80-29.00
<b>Tuna:</b>		
In oil (Japan) . . . . .	48/7-oz.	7.00-7.60
In oil, Customer's label (Peru) . . . . .	48/7-oz.	6.40-6.80
<b>Pilchards (sardines):</b>		
Booth's (U. S.) . . . . .	48/15-oz.	9.25
Customer's label (Japan) . . . . .	48/15-oz.	7.80-7.90
Customer's label (Japan) . . . . .	96/7½-oz.	9.30
Customer's label (S. Africa) . . . . .	48/15-oz.	7.84-8.05
<b>Sardines:</b>		
Olive oil (Portugal) . . . . .	100/¼-club½	8.20-9.50
Olive oil (Morocco) . . . . .	100/¼-club½	8.40
1/4.4-oz. per can.		
Note: From United States Consulate in Antwerp, September 9, 1960.		



## British Guiana

NEW POLICY TO ENCOURAGE  
DEVELOPMENT OF FISHING INDUSTRY:

The Government of British Guiana has decided on a policy to encourage the development, by local or foreign capital, of the fishing industry. The concessions and conditions for establishment of locally-incorporated companies for the purpose of engaging in shrimp trawling, with the employment of mainly Guianese labor, include: (1) duty-free import of machinery, etc., and of fishing vessels with equipment, and (2) the Government control of disposal of catches

## British Guiana (Contd.):

on the local market, in accordance with the Fisheries Ordinance and Regulations, but without restrictions on imports. Companies will be subject to local income tax as levied generally on companies and individuals, but the Government would be prepared to consider granting an income tax holiday for the processing and canning of fish, crustaceans, and all types of seafood and marine products and the manufacture of fish meal, but will not grant a tax holiday for fishing and freezing and/or packaging. Imports of supplies, other than fishing vessels and machinery for canning or fish meal plants, will be subject to import duty, and exports of shrimp and fish to an export duty, which is at present  $1\frac{1}{2}$  percent ad valorem.

A French company plans to set up a plant for fish processing and for the manufacture of fish meal and other products in Berbice. It is proposed to establish a fishing base, complete with boats and refrigeration plant and a shrimp-culture station on approximately 1,000 acres of swamp land. The Government is expected to participate in the latter project. (West Indies Fisheries Bulletin, May/June 1960.)



## Canada

## BRITISH COLUMBIA VESSELS FISH FOR TUNA OFF CALIFORNIA COAST:

Fair catches of albacore tuna were landed during the week ending September 23 by four British Columbia salmon seiners. It is reported that the fish were caught mainly by salmon seines, but in part on trolling lines. Catching albacore by salmon seines required fast sets. The vessels, which left Vancouver early in September, were out 18-21 days but poor weather made it impossible to seine for the first 8-9 days, when trolling was tried with no great success. One vessel caught 2 tons and another 5 tons by trolling. A third vessel, Blue Pacific I, with the best catch (30 tons), made one seine set of about 10 tons. The Pacific Belle was second high boat with 16 tons, Skardale next with 15 tons, and the Dominator (70-foot steel combination halibut-herring vessel) with  $6\frac{1}{2}$  tons. In the case of the Dominator, it was reported that the noise of the rings as the seine net was let out frightened the "wild" albacore away. In one set on a "huge body

of fish" they took only a single fish that had been gilled in the mesh. Most of the fishing was done 100 miles southwest of the mouth of the Columbia River.

At the dock the fish were graded out when unloaded. About 15-20 percent were graded as Number 2 fish because of splits and bruises. A British Columbia packing firm bought the albacore at \$300 a ton for Number 1 and \$150 a ton for Number 2.

A British Columbia fishermen's union is asking that the Canadian Government charter 6 British Columbia seiners for exploratory fishing to develop a Canadian tuna fishery. (The Fisherman, a fishery trade periodical, September 23, 1960.)

\*\*\*\*\*

## FISH MEAL AND OIL PRODUCTION, 1958-59:

Canadian fish-meal production amounted to 72,393 short tons in 1958 as compared with 77,177 tons in 1959.

Canadian fish-oil production during 1959 was estimated at 7,737,000 Imperial gallons.

The price paid to British Columbia fishermen for herring, the main species of fish used for reduction, was C\$13 per short ton during the last few months of 1959. The Canadian authorities state that most companies did not resume buying after the Christmas close-down.

Waste from the fresh fish-processing (filleting) plants is the chief raw material used by the fish-meal plants on the Atlantic Coast.

Most but not all of the producers of fish meal and oil are members of industry associations. On the Pacific Coast the group is known as the Fisheries Association of British Columbia; for the Atlantic Coast, the group is the Atlantic Fisheries By-Products Association. (United States Embassy in Ottawa, July 20, 1960.)

\*\*\*\*\*

## LABELING REQUIREMENTS FOR CANNED SARDINES ANNOUNCED:

The Canadian Inspection and Consumer Service, Department of Fisheries, Ottawa, Canada, has issued a ruling on the labeling of canned fish marked "Sild" or "Brisling" imported into Canada.

## Canada (Contd.):

It is the view of the Department of Fisheries that for informative labeling, the word "Sardines" should be used in association with the words "Sild" or "Brisling." Furthermore, the words "Brisling Sardines" or "Sild Sardines" shall be displayed in letters of equal height and prominence. However, where the word "Sardines" only appears on the label, it will not be necessary to indicate whether the contents are "Sild" or "Brisling."

In order to give the importers time to conform to the labeling requirements of these products, the Department of Fisheries will permit the use of existing stocks of labels until March 31, 1961. All imports of "Sild" and "Brisling" packed after that date will, however, be required to comply with these labeling requirements.

\* \* \* \* \*

**OUTLOOK FOR THE GEORGES BANK SCALLOP FISHERY:**

History of Fishery: Georges Bank supports the world's largest scallop fishery. United States boats started extensive commercial fishing on this Bank in the early 1930's and since then there has been a continuous history of good production. After World War II, United States landings increased and since 1955 they have remained in the neighborhood of 18 million pounds of shucked meats annually.

Canadian boats began scallop fishing on Georges Bank just after World War II. At that time few boats were equipped for off-shore scallop fishing and until 1952 one or two boats made intermittent trips to the Bank. Other areas such as St. Pierre Bank and Port au Port Bay, Newfoundland, were fished by some boats. Since 1952, however, the Canadian offshore scallop fleet has concentrated almost exclusively on Georges Bank and has expanded rapidly. Annual landings have risen steadily and in 1959 reached 4.3 million pounds. So far, 1960 landings have continued this rising trend.

Canadian crews have become much more efficient at scallop fishing, but the primary cause of increased Canadian landings is the build-up of the offshore scallop fleet. From one or two boats prior to 1952, the fleet has increased to 20 boats and indications are that more boats will be constructed. The

United States fleet has also expanded and over 70 boats now sail out of New Bedford. The result is that steady, increased pressure has been placed on Georges Bank scallop stocks.

Fluctuating Limits: In any natural population, there is a limit to the number of animals that can be caught. This limit is variable because variable natural conditions regulate reproduction and abundance. For example, in the Digby scallop fishery we have found that great abundance changes are related to water temperature at spawning time. Georges Bank scallop stocks also show great year-to-year changes in success of reproduction. These changes are usually uncontrollable but sometimes they are predictable.

In the past year there has been a great abundance of market-size scallops on Georges Bank. An accurate estimate of their age is difficult but it appears that almost all the scallops now being fished were spawned in the same year--either 1954 or 1955. A few of these were fished in early 1959, but by late 1959 they constituted the bulk of the catch and 1960 large catches depend almost entirely on this single year-class. We do not understand why this one spawning was so successful but with continued research we hope to find the answer. Even if we can't explain the situation, we are able to predict the effects it will have.

Predicted Decline in Landings: Canadian and United States scientists have been sampling the Georges Bank scallop population on both commercial and other beds for several years. Many of the samples have been taken with a small-mesh drag, which captures both market-size scallops and small scallops that must grow for several years before they reach commercial size. Counts of these undersize scallops give a fair idea of what the future holds for the fishery. For instance, we were able to foresee the 1959-60 increase in landings from the tremendous number of scallops just under commercial size which came up in our early 1959 samples.

Our 1960 samples contain very few small scallops. The year-class being fished now is very abundant but the next one or two year-classes appear to be much below normal. This means that undoubtedly catches will decline significantly when this abundant year-class is fished out. From our information it appears that catches will begin to decrease by the end of this year and will remain low for at least two years.



## Canada (Contd.):

**Effects of Decline:** It is difficult to predict the extent and the effect of greatly reduced landings from the fished areas. In most fisheries when production drops in one area the fleet moves to other grounds. The scallop fishery is somewhat different than other fisheries; first, because scallop stocks do not move about like schools of cod and haddock; and second, because no other area has extensive scallop populations like those found on Georges Bank. Furthermore, Georges Bank has been well explored and it appears to have no areas, fished or unfished, which have extensive quantities of young scallops. It is doubtful if other parts of the Bank can make up for the big drop in catches from regularly fished areas.

Our offshore fleet will probably be unable to turn to other regions to offset reduced catches from Georges Bank. Scallop beds in the Gulf of St Lawrence are too small and their production too variable from year to year. Surveys of other offshore banks indicate that scallops are too sparse to make fishing commercially attractive for an extensive period of time. The fleet will probably have to be satisfied with the small catches it will be able to take on Georges Bank. Total production from our whole coast as well as from Georges Bank will probably remain low for at least two years.

Reduced catches may encourage some Georges Bank fishermen to shuck many of the small scallops they now throw overboard. This would be a short-sighted policy. In the first place it would require more shucking effort to produce every pound of meat. Secondly, it would probably delay recovery of the stocks of large scallops to more abundant levels.

**Planning Adjustment:** It is hoped that releasing this statement now will aid the offshore scallop fishery to plan for the changes we have predicted. Our research program is continuing and it is planned to make periodic reports to industry on the status of the Georges Bank scallop population.

--By N. Bourne, Biological Station,  
Fisheries Research Board of Canada,  
St. Andrews, N. B.  
(September 1960).

\* \* \* \* \*

12-MILE FISHING LIMIT  
UNDER CONSIDERATION:

Canadian Government authorities have under "active consideration" the declaration of a 12-mile fishing limit off Canada's sea coasts, according to the October 19, 1960, Ottawa Journal. But the paper did not indicate when a decision would be announced. The present fishing and territorial limit for Canada is three miles.



## Cuba

PROGRAM TO BUILD 570 NEW  
FISHING VESSELS ANNOUNCED:

The Cuban press has announced that on October 1 work was started on the construction of 570 new fishing vessels from 33-75 feet in length in ten shipbuilding centers located from Camaguey to Pinar del Rio under the supervision of the Naval Construction Office of the Fisheries Department of the National Institute for Agrarian Reform (INRA).

According to the press account, 205 units of the sigma type, 33 feet in length, will be constructed in the first stage of the shipbuilding plan, in the following shipbuilding centers: Puerto Esperanza 40; Surgidero de Batabano 20; Cardenas 40; Caibarien 30; Isabela de Sagua 30; Cienfuegos 15; Nuevitas 15; and Santa Cruz del Sur 15.

Later on, other types will be built, including the Omicron, 75 feet in length. The stated purpose of the fishing vessel program is to stimulate to the greatest possible extent the fishing and shipbuilding industries in Cuba in order to foster economic development. The shipbuilding plans were said to have been finalized at a meeting of the heads of workshops and provincial delegates of Ship Construction held in the INRA's Fisheries Department on September 16, 1960. (The United States Embassy in Havana reported on September 26, 1960.)



## Denmark

DISPUTE OVER PROFIT-SHARING  
BETWEEN VESSEL OWNERS AND  
CREWS AT ESBJERG ENDS:

Upwards of 500 fishing vessels were idle early in September 1960 in the Danish West

## Denmark (Contd.):

Jutland fishing port of Esbjerg as a result of a controversy which began August 22 between the vessel crews and vessel owners over the division of profits. Originally affecting only the herring boats, the tie-up spread to virtually the entire Esbjerg fleet. As of early September the controversy had already cost the fishermen of Esbjerg about ten million kroner (about US\$1.5 million) in shares. Esbjerg is Denmark's largest fishing port, the value of the annual catch landed there topping 75 million kroner (US\$10.9 million).

The trouble began when the Esbjerg Fishing Captains' and Vessel Owners' Association refused to accede to the demand of the Fishermen's Union that crew members be accorded a share in the annual profits of a vessel. Under terms of the current agreement, crew members share in a portion of the value from the sale of each trip, but the remainder of the value is accumulated by the captains and owners in a reserve fund and then divided up between themselves on an annual basis. The crew members now want a slice of this portion as well.

After many days of refusing to enter into discussions except each on his own terms, the Owners' Association and Union representatives sat down on September 6 and reached a preliminary agreement to discuss differences.

The tie-up came to an end on September 15, after the Fisheries Minister had stepped in to promote peace between vessel owners and crew members.

Terms of the agreement, worked out by the vessel owners and crew member representatives and ratified by the Fishermen's Union, provide for those crew members who are share fishermen to be given shares of reserve-fund payments as well as shares in immediate sales. The share fishermen maintained that the captains were in a position to direct an unfair portion of the receipts into the reserve fund at the expense of that portion which was shared with crew members.

Other work and wage conditions under contention were deferred for later discussion. One specific point not gained by the Fishermen's Union was its demand that all vessels fishing for the cooperative herring

oil factory agree to hire only union crew members.

Fishing vessels began to put off from Esbjerg soon after the agreement was ratified. (United States Embassy, Copenhagen, September 7, 1960.)

\* \* \* \* \*

# FOREIGN TRADE IN FISH MEAL AND MARINE OILS, 1959:

Exports: In 1959 Danish exports of fish meal amounted to 58,770 metric tons, valued at US\$10.7 million. The United Kingdom and the Netherlands were the principal buying nations (see table 1).

Table 1 - Denmark's Exports of Fish Meal by Type and Destination, 1959

Type and Destination	Qty.	Value	
		Metric Tons	US\$ 1/1,000
<b>Herring Meal:</b>			
Finland .....	1,782	2,342.0	339.6
Sweden .....	1,695	2,132.0	309.1
Belgium-Lux. .	501	618.0	89.6
Czechoslovakia.	626	778.0	112.8
France .....	540	706.0	102.4
Holland .....	13,185	16,629.0	2,411.2
Ireland .....	759	970.0	140.7
Italy .....	809	1,086.0	157.5
Switzerland ...	2,024	2,628.0	381.1
United Kingdom	30,456	38,747.0	5,618.3
West Germany .	2,858	3,566.0	517.1
East Germany .	703	874.0	126.7
Egypt .....	60	79.0	11.5
Mexico .....	40	54.0	7.8
Philippines ...	76	100.0	14.5
<b>Total .....</b>	<b>56,114</b>	<b>71,309.0</b>	<b>10,339.8</b>
<b>Other Fish Meal:</b>			
Sweden .....	210	249.0	36.1
Belgium-Lux. .	118	73.0	10.6
Czechoslovakia.	96	111.0	16.1
Gibraltar .....	5	6.0	.9
Holland .....	449	461.0	66.8
Italy .....	10	12.0	1.7
Switzerland ...	20	24.0	3.5
United Kingdom	378	368.0	53.4
East Germany .	671	779.0	113.0
West Germany .	699	678.0	98.2
<b>Total .....</b>	<b>2,656</b>	<b>2,761.0</b>	<b>400.3</b>
<b>Grand Total .....</b>	<b>58,770</b>	<b>74,070.0</b>	<b>10,740.2</b>
1/Values converted at rate of one krone equals US\$0.1450.			

During the first four months of 1960 Danish fish-meal exports amounted to 9,841 metric tons, valued at 7 million kroner (US\$1.0 million), compared with 26,000 tons, valued at 27.5 million kroner (US\$4.0 million) for the same period in 1959. As of June 1960 the average export price was approximately 60 øre a kilogram (US\$78 per short ton) as compared with 1.16 kroner a kilogram (US\$152 per ton) a year earlier. Peruvian competition was blamed for the price decline; however, Peruvian prices also declined from US\$140 to \$70 a metric ton over the same period.

## Denmark (Contd.):

It was reported that stocks of fish meal and oil were accumulating in Denmark in July of 1960, with consequent downward pressure on the price of industrial fish for reduction. Two Esbjerg marine oil factories reduced their prices for industrial fish to 14 øre per kilogram (US\$18 per short ton) in June 1960. Danish fishermen have attempted to market their industrial catches abroad, but have found that the prices in Norway dropped from 17 to 12 øre per kilogram (US\$22 to \$16 per ton), and in Holland, down to 8 øre per kilogram (US\$10 per ton).

Danish exports of fish solubles amounted to 1.5 million kroner (US\$217,500) in 1957, and increased to almost 7 mil-

would not accept shipments priced at \$35 per ton freight inclusive. It is reported that the United States is now covering its needs for fish solubles by domestic production, and that there are large stocks of fish solubles now in storage on the East Coast. For this reason, Danish producers are storing fish solubles in the hope that the market will improve in the future.

**Imports:** In 1959 Denmark imported 13,438 metric tons of fish meal, principally from Iceland and Norway; it was valued at US\$2.2 million (see table 2).

Denmark's 1959 imports of marine oils amounted to 8,177 metric tons of herring oil, valued at US\$1.5 million, and 2,197 tons of medicinal and veterinary train oil, valued at US\$2.0 million (see table 3). (United States Embassy, Copenhagen, June 21, 1960.)



## Ecuador

## FISH MEAL AND OIL INDUSTRY:

The Ecuadorean fish-meal industry is based principally on the utilization of waste from tuna canning supplemented by crudely-processed sun-dried fish. Production of meal is estimated to be about 500 tons a year. Neither oil nor stickwater are produced. All meal currently produced in Ecuador is used within the country for animal feed.

There is only one mechanical dryer in operation. It is connected with a tuna cannery at Manta. It is a batch dryer, using steam, that can handle about 1½ tons of cooked tuna scrap in six hours. However, since the material is not pressed to extract the oil, it has been found preferable to process the scrap in the dryer for two hours and then sun-dry it on the ground for six days before milling and bagging. Although the protein content is lowered somewhat by this method, the oil content is brought down appreciably.

The tuna heads, since they are removed from the whole fish before cooking, are processed separately. The heads are retained until the lot of fish for the day has been cooked, then they are cooked and placed in the dryer for two hours, and sun-dried later. The tuna viscera are discarded.

The tuna meal, which comes from skipjack tuna, is reported to run between 50 and 70 percent protein with the heads yielding the lower values.

There are several small operations near Valdivia and Salinas that sun-dry thread herring (pinchagua, *Opiasthorema libertate*). Processing is simple. The fish are cooked and then spread on the ground to dry and when dried, ground into meal.

Before the world-wide drop in fish-meal prices, several persons were interested in installing fish-meal equipment. But with the break in the market, these projects have been abandoned.

In Manta there are 25 small bait-boats fishing for skipjack and four more under construction. These boats are all privately owned--mostly by fishermen. They are 40 to 50 feet long and carry crews of 15 to 20 men. When a mothership is not available, the boats return to port daily to unload the catch since the boats are not equipped with refrigeration nor do they carry ice. The fishermen were reported to be receiving 1,100 sucres (about US\$65) per short ton for skipjack. The thread herring fishermen are said to be paid 10 to 11 sucres per 100 pounds (about US\$11.24-12.36 per short ton).

Tuna meal, in quantity lots to distributors, was quoted in October 1960 at 70 sucres per 100 pounds (about US\$78.60 a short ton), f.o.b. plant.

Table 2 - Denmark's Imports of Fish Meal by Type and Origin, 1959

Type and Origin	Qty.	Value	
		Metric Tons	US\$ 1,000
<b>Herring Meal:</b>			
Iceland .....	523	617.0	89.5
Norway .....	241	251.0	37.8
<b>Total .....</b>	<b>764</b>	<b>878.0</b>	<b>127.3</b>
<b>Other Fish Meal:</b>			
Iceland .....	8,404	9,557.0	1,385.8
Norway .....	3,970	4,532.0	657.1
United Kingdom ...	300	335.0	48.6
<b>Total .....</b>	<b>12,674</b>	<b>14,424.0</b>	<b>2,091.5</b>
<b>Grand Total .....</b>	<b>13,438</b>	<b>15,302.0</b>	<b>2,218.8</b>

lion kroner (US\$1.0 million) in 1958, and to 11 million kroner (US\$1.6 million) in 1959 (of which the United States received an amount valued at 10 million kroner or US\$1.5 million). But only 129 metric tons were shipped to the United States in the first four months of 1960 as compared to 23,000 tons for the year 1959. Whereas in 1959 United States importers paid prices ranging from US\$80-95 per short ton, this year they

Table 3 - Denmark's Imports of Marine-Animal Oils 1/ By Type and Country of Origin, 1959

Type and Origin	Qty.	Value	
		Metric Tons	US\$ 1,000
<b>Herring Oil:</b>			
Norway .....	191	346.0	50.2
Sweden .....	518	606.0	87.9
West Germany .....	5,342	6,708.0	972.7
Portuguese W. Africa .....	504	638.0	92.5
Peru .....	1,103	1,198.0	173.7
United States .....	519	663.0	96.1
<b>Total .....</b>	<b>8,177</b>	<b>10,159.0</b>	<b>1,473.1</b>
<b>Medicinal and Veterinary Train Oil:</b>			
Iceland .....	311	485.0	70.3
Norway .....	1,325	2,254.0	328.8
United Kingdom ...	57	127.0	18.4
West Germany .....	504	775.0	112.4
<b>Total .....</b>	<b>2,197</b>	<b>3,641.0</b>	<b>527.9</b>
<b>Grand Total .....</b>	<b>10,374</b>	<b>13,800.0</b>	<b>2,001.0</b>

1/Does not include imports of 7,164 tons of whale oil.

### Ecuador (Contd.):

Export charges on meal consist of a tax of 10 sucres (about 67 U. S. cents) a metric ton (gross weight) plus port charges of 1/4 of one percent of the f.o.b. price.

There are no import duties on fish meal imported for fertilizer. If it is imported for animal feed the duties are 10 centavos a kilo (about US\$6.67 a metric ton) specific plus 3 percent ad valorem. In either case, whether imported as feed or fertilizer, there are certain other charges. These consist of:

1. 135 sucres per 100 kilos (about \$90 a metric ton) for pier taxes.
2. 9.5 percent of f.o.b. value for consular fees.
3. 2.0 percent of f.o.b. value additional fee.
4. 5.0 percent of c.i.f. value for Comision de Valores.
5. 1.0 percent of c.i.f. value additional fee.

According to the Banco Central del Ecuador no fish meal was imported in 1958 or 1959, and during the first five months of 1960 only a sample of about 211 pounds was imported. According to this same source fish-meal exports began in 1957 when 188 metric tons were exported. In 1958 exports were 47 tons and in 1959 they amounted to 295 tons. There have been no exports of fish meal since October or November 1959.

There are no indications that processing procedures will be changed in the near future nor are there any plans for utilizing the stickwater or the oil.

Owing to increased poultry production, the consumption of fish meal in Ecuador has been increasing during the past 2 or 3 years. Annual consumption of fish meal is still quite small and there is no indication of any great increase in the immediate future. The fish meal is used chiefly in poultry feed since it is reported that prepared feeds are still too costly for pigs. Local production of meal will probably take care of all immediate requirements.

The principal oil imports of marine origin are whale and cod oil. During the first five months of 1960, according to the Banco Central, 83.9 metric tons of whale oil, 10.7 tons of cod oil, and 4.2 tons of fish oil were imported. There is no indication that local production will be able to replace these imports in the near future.

It does not appear probable that Ecuador soon will be in a position to provide any quantities of fish meal or oil for export. The production of tuna meal is limited to cannery waste and the country can probably consume all that is produced.

Two other sources of meal and oil appear to be present--the pinchagua (thread herring) and the anchoveta (*Ceten-graulis*), but it is probable that the stocks of these two species are limited in abundance since they are reported not to occur along the entire coast. Their distribution is scattered. The anchoveta is reported to be most abundant in the Gulf of Guayaquil while the pinchagua is more prevalent in the vicinity of Salinas and near Esmeraldas. The pinchagua is now being used for fish meal to some extent but there are no plans for expansion. (United States Embassy, Mexico City, report of October 11, 1960.)



### Egypt

#### LOAN BY UNITED STATES TO AID SHRIMP FREEZING FIRM:

The Development Loan Fund on October 24, 1960, announced the signing of a United

States Government loan of \$200,000 to a privately-owned company of Alexandria, Egypt, to help expand and improve its present vegetable and fruit canning and shrimp freezing operations.

The project involves the procurement in the United States of a shrimp grader and shrimp freezing equipment plus equipment for processing vegetables; boiler and related equipment; and workshop and laboratory equipment. This equipment will provide the company with facilities to balance its operations for year-round production rather than seasonal fluctuations, and the freezer equipment will allow year-round storage of shrimp.

This is one of the priority projects in the first Five-Year Industrial Plan of the Egyptian Region of the United Arab Republic. The Region has sought to establish a sounder balance between production of food crops and nonfood market crops, in order to reduce its dependence upon food imports. All of the vegetable and citrus fruits are grown locally, and the shrimp is available from the local fishing industry. Hitherto lack of facilities for processing and for deferred merchandising of perishable crops has discouraged producers.

Note: Also see Commercial Fisheries Review, November 1959 p. 64.

\* \* \* \* \*

#### IMPORT LICENSES FOR MORE JAPANESE CANNED FISH ISSUED:

The Government of the United Arab Republic has announced that it would issue import licenses on canned fish from Japan for the second time this year. The amount of the licenses will be US\$1,000,000--more than the usual amount of \$800,000. In the past, some 70 percent was for canned mackerel-pike, about 20 percent for tuna canned in oil, and about 10 percent for "horse-mackerel" and common mackerel. This time, since light-meat tuna in oil is almost unobtainable and production of "horse mackerel" is short, possibly about 90 percent of the licensed amount will be for canned mackerel-pike.

Accordingly, exports of mackerel-pike of 100,000-120,000 cases are expected for Egypt and the Japanese exporters want to stabilize sales by putting a quantitative agreement into practice. If it is impossible, they desire to conclude a price agreement only and this is being studied by a committee organized for that purpose. (Suisan Tsushin, September 7, 1960.)



## German Federal Republic

### FISH-MEAL PRODUCTION, FOREIGN TRADE, AND CONSUMPTION:

**Production:** Fish-meal production in Western Germany increased from 83,100 metric tons in 1958/59 to 94,000 tons in 1959/60 (July 1959-June 1960), with herring meal showing the greatest increase.

**Foreign Trade:** Imports of fish meal increased from 140,800 tons in 1958/59 to 179,200 tons in 1959/60, while exports remained fairly constant at 9,000 and 9,500 tons, respectively. During 1958/59 Peru supplied 41 percent of the fish meal imports, but in 1959/60 that country supplied 72 percent. In the first half of 1959, fish meal imports were 79,000 tons; the same amount was imported the second half of 1959. But in January-June 1960 they climbed to 100,000 tons.

**Consumption and Stocks:** It is anticipated that fish-meal consumption will rise sharply by the end of 1960 (see table 1).

The increased domestic production and imports of fish meal are being absorbed by the large production of hogs

Table 1 - Western Germany's 1/Supply and Distribution of Fish Meal, 1958-60

	1959/60	1958/59		
	.... (Metric Tons)....			
Stocks beginning of year 2/...	3,700	4,700		
Production (in plants with more than 10 employees):				
Cod meal 3/.....	15,800	14,000		
Fish meal 3/.....	52,500	48,300		
Herring meal 3/.....	22,100	16,800		
Total large plant production ..	90,400	79,100		
Other production 4/.....	4,500	4,000		
Grand total production .....	94,900	83,100		
Imports .....	5/ 179,200	5/ 140,800		
Total Supply .....	277,800	228,600		
Exports .....	9,500	9,000		
Consumption .....	261,400	215,900		
Stocks 6/ .....	6,900	3,700		
1/Includes West Berlin and Saarland since July 1959.				
2/At beginning of year in hands of fish-meal industry.				
3/Requirements:				
	Minimum	Maximum		
	Protein	Ca Phosphate	Fat	Salt
	..... (Percent).....			
Cod meal .....	60	18	3	3
Fish meal .....	55	15	8	5
Herring meal .....	55	8	12	8
4/Includes meal from shrimp waste.				
5/Peru supplied 129,300 tons in 1959/60 and 57,400 tons in 1958/59.				
6/End of year.				

and increased poultry production. But because fish meal prices in the first half of 1960 were so low and oil cake prices high, there no longer is an incentive to substitute vegetable protein for animal protein. (U. S. Foreign Agricultural Service Report, Bonn, October 4, 1960.)

\*\*\*\*\*

### FOREIGN TRADE IN MARINE-ANIMAL OILS, 1958-1959:

**Exports:** Marine oil exports (fish, fish-liver, whale, etc.) from West Germany increased from 20,100 metric tons in 1958 to 33,400 tons in 1959. While only 60 percent of the 1958 exports were edible marine oils (fish, fish-liver, and whale), 96 percent of the 1959 exports were edible.

Table 1 - West Germany's Exports of Marine-Animal Oils, By Type, 1958-1959

Type	1959	1958
	.. (Metric Tons) ..	
Edible:		
Marine and similar fats .....	6,000	4,800
Other marine fats & oils .....	26,000	7,200
Total .....	32,000	12,000
Industrial:		
Whale oil and fat .....	100	300
Other marine fats & oils .....	1,300	7,800
Total 1/ .....	1,400	8,100
Grand Total .....	33,400	20,100
1/Does not include industrial-use marine fatty acid exports-- 3,200 tons in 1959 and 2,200 tons in 1958.		

Norway buys the greater part of Germany's marine oils, with Denmark and Sweden receiving lesser yet significant amounts. The United States buys no marine oils from West Germany.

**Imports:** Imports of edible marine oils (fish, fish-liver, whale, etc.) into West Germany decreased from 129,100 metric tons to 121,900 tons in 1959. Smaller require-

Table 2 - West Germany's Imports of Marine-Animal Oils, By Type, 1958-1959

Type	1959	1958
	... (Metric Tons) ..	
Edible:		
Whale oil .....	67,800	70,500
Other marine oils .....	54,100	58,600
Total .....	121,900	129,100
Industrial:		
Whale oil and fat .....	12,200	8,300
Other marine oils & fats .....	10,900	5,700
Total 1/ .....	23,100	14,000
Grand Total 2/ .....	145,000	143,100
1/Does not include industrial-use marine fatty acid imports-- 8,500 tons in 1959 and 9,000 tons in 1958.		
2/Evidently does not include fish-liver oils and degreas (tanning fat of marine origin).		

ments in the margarine industry caused this decline. Industrial marine-oil imports increased from 14,000 tons in 1958 to 23,000 tons in 1959.

In 1958 West Germany received 21,300 tons of fish oil from the United States out of a total of 64,300 tons imported. This compared with 22,000 tons from the United States in 1959 out of a total of 65,000 tons.

## German Federal Republic (Contd.):

Table 3 - West Germany's Imports of Marine-Animal Oils, By Type and Country of Origin, 1959

Type and Origin	Quantity Metric Tons
<b>Fish-Liver Oils:</b>	
Denmark . . . . .	372
Iceland . . . . .	402
Norway . . . . .	466
Others . . . . .	446
Total . . . . .	1,686
<b>Whale Oil and Whale Fat:</b>	
United Kingdom . . . . .	1,626
Iceland . . . . .	507
Holland . . . . .	3,218
Norway . . . . .	36,068
Portugal . . . . .	1,219
Union of South Africa, etc. . . . .	310
United States . . . . .	871
Peru . . . . .	3,409
Japan . . . . .	29,785
Australia . . . . .	2,617
Others . . . . .	341
Total . . . . .	79,971
<b>Other Marine Fats and Oils:</b>	
Belgium . . . . .	394
Denmark . . . . .	6,169
United Kingdom . . . . .	689
Holland . . . . .	3,838
Norway . . . . .	7,297
Portugal . . . . .	3,341
Sweden . . . . .	319
Angola . . . . .	4,371
Morocco . . . . .	511
Union of South Africa, etc. . . . .	1,198
Canada . . . . .	1,549
United States . . . . .	21,986
Peru . . . . .	8,833
Japan . . . . .	3,790
For re-export . . . . .	530
Others . . . . .	199
Total . . . . .	65,014
<b>Degrasl:</b>	
Holland . . . . .	314
<b>Sperm Oil:</b>	
Destination not given . . . . .	17
Grand Total . . . . .	147,002
1/Tanning fat of marine origin.	

Norway, Japan, and the United States are the primary suppliers of marine oils to West Germany. (U. S. Foreign Agricultural Service Report, Bonn, April 14, 1960.)

\*\*\*\*\*

## IMPORTS, EXPORTS, AND PRODUCTION OF EDIBLE FISH OILS, 1957-59:

The shrinking West German market for edible fish oil (not including fish-liver oil, whale oil, etc.) has been accompanied over the past few years by slowly declining imports and sharply increasing exports. Trade sources say that lessening domestic demand has resulted mostly from a growing consumer preference for margarine made of vegetable fats and oils. Prices of imported edible fish oil dropped an average of 20.3 percent during 1957 through 1959. (See table 1.)

West German production of fish oil, after declining to 19,193 metric tons in 1958, rose again to 25,065 tons in 1959. This increase was attributed primarily to the availability of more raw material as a result of the higher percentage of fish declared unfit for human consumption in 1959. In addition, fish oil production aboard West German trawlers continued to increase. In 1957 production amounted to 21,155 tons. (It is estimated that West Germany produced an additional 6,000 tons of cod-liver oil in 1959. Almost 70 percent of that production went into medical and veterinarian uses. The remaining 30 percent was exported, primarily for vitamin extraction. An insignificant amount was used for margarine.)

Trade sources estimate that approximately 95 percent of the West German 1959 production of edible fish oil was exported. Exports increased from 7,236 tons in 1958 to 25,985 tons in 1959. Several reasons have been given for this development.

In the first place, the Scandinavian countries and the Netherlands were willing to pay more for West German fish oil than West German margarine manufacturers were. Norway took nearly 56 percent of West German fish oil exports in 1959, reportedly because (a) its own production dropped considerably, and (b) an estimated 60 percent of the Norwegian output was exported under a long-term contract to Russia. (See table 2.)

West German imports of edible fish oil during the past three years declined steadily but slowly, from 59,383 tons in 1957 to 54,465 tons in 1959. The pattern of imports during these three years changed significantly. Imports from Iceland, Angola, and the Union of South Africa dropped considerably, while Denmark, the Netherlands, Peru, and Japan developed into volume suppliers. Most of the change in the import pattern is ascribed to the relatively lower prices at which edible fish oil was offered by the latter group of countries.

Throughout the past three years, the United States continued to account for the biggest share in West German imports. After a drop from 28,527 tons, or 48 percent of total West German edible fish oil imports in 1957, to 21,294 tons, or 37 percent in 1958, United States shipments increased again to 21,986 tons or 40.4 percent in 1959. However, United States fish oil managed to maintain its leading position in the West German fish oil

## German Federal Republic (Contd.):

market only through a 20 percent reduction in its prices during the past three years. (See table 3.)

many is said to have developed a decided preference for United States menhaden oil, to the processing of which it has become accustomed.

Table 1 - West Germany's Imports of Edible Fish Oils<sup>1/</sup> by Country of Origin, 1957-59

Country	Quantity			Value <sup>2/</sup>					
	1959	1958	1957	1959		1958		1957	
	(Metric Tons)	(Metric Tons)	(Metric Tons)	DM1,000	US\$1,000	DM1,000	US\$1,000	DM1,000	US\$1,000
Denmark . . . . .	4,827	2,041	1,059	3,519	838	1,513	362	937	223
Great Britain . . . . .	508	508	-	410	98	394	94	-	-
Iceland . . . . .	251	7,464	5,463	198	47	6,092	1,450	4,871	1,160
Netherlands . . . . .	3,329	2,489	1,585	2,291	545	1,839	438	1,353	322
Norway . . . . .	5,296	6,233	5,687	4,477	1,066	5,757	1,371	6,212	1,479
Portugal . . . . .	1,286	759	900	911	217	589	140	851	203
Angola . . . . .	2,891	5,641	9,423	2,149	512	4,254	1,013	8,310	1,979
Morocco . . . . .	255	151	-	156	37	111	26	-	-
Union of South Africa . . . . .	1,199	9,241	4,664	844	201	6,836	1,628	4,020	957
Canada . . . . .	1,549	1,645	411	1,190	283	1,342	320	412	98
United States . . . . .	21,986	21,294	28,527	16,145	3,844	17,188	4,092	26,247	6,249
Panama . . . . .	-	-	239	-	-	-	-	209	50
Peru . . . . .	7,098	-	1,136	4,543	1,082	-	-	1,011	241
Japan . . . . .	3,790	-	25	2,968	707	-	-	20	5
Other . . . . .	200	86	264	162	39	64	15	247	59
Total . . . . .	54,465	57,552	59,383	39,963	9,516	45,979	10,949	54,700	13,025

<sup>1/</sup>Exclusive of fish-liver oil, whale oil, and other marine oils.

<sup>2/</sup>Values converted to US\$ at rate of DM4.20 equals US\$1.

Prospects for imported edible fish oil in the West German market are difficult to judge. The marketing potentiality of foreign oil would seem to depend to a considerable

From a long term point of view, competition between domestic and foreign fish oil suppliers in the West German market is expected to become keener, not only because

Table 2 - West Germany's Exports of Edible Fish Oils<sup>1/</sup>, 1957-59

Country	Quantity			Value <sup>2/</sup>					
	1959	1958	1957	1959		1958		1957	
	(Metric Tons)	(Metric Tons)	(Metric Tons)	DM1,000	US\$1,000	DM1,000	US\$1,000	DM1,000	US\$1,000
Denmark . . . . .	4,209	3,556	989	3,118	742	2,752	655	882	210
Netherlands . . . . .	2,561	1,596	1,541	1,874	446	1,244	296	1,423	339
Austria . . . . .	-	-	19	-	-	-	-	23	5
Norway . . . . .	14,672	1,070	-	10,397	2,475	787	187	-	-
Sweden . . . . .	4,543	1,014	1,703	3,301	786	874	208	1,558	371
Total . . . . .	25,985	7,236	4,252	18,690	4,449	5,657	1,346	3,886	925

<sup>1/</sup>Exclusive of fish-liver oil, whale oil, and other marine oils.

<sup>2/</sup>Values converted to US\$ at rate of DM4.20 equals US\$1.

extent on the possibility of German fish oil finding a market abroad. This involves such imponderables as (1) the size of the fish catches in countries now buying German edible fish oil, (2) the development of consumer preferences with regard to consumption of butter and of higher quality vegetable margarine, and (3) in the case of Norway, continued exports of fish oil to Russia.

German trade sources like to think that, at least in the coming few years, their sales of fish oil abroad will continue to be high. Consequently, they expect West German needs for imported fish oil to remain high, although declining slowly. It is predicted that United States menhaden oil will continue to account for a major percentage of overall West German fish oil imports. A leading margarine-producing company in West Ger-

Table 3 - Average Imports, Exports, and Ex-Plant Prices in West Germany for Edible Fish Oils, 1957-59

Country of Origin	Average Prices for Imports C.I.F. German Border Points					
	1959	1958	1957	1959	1958	1957
	DM Per Metric Ton	DM Per Metric Ton	DM Per Metric Ton	US\$ Per Metric Ton	US\$ Per Metric Ton	US\$ Per Metric Ton
Denmark . . . . .	729	741	885	173.57	176.43	210.71
Iceland . . . . .	790	816	892	188.10	194.29	212.38
Netherlands . . . . .	688	739	854	163.81	175.95	203.33
Norway . . . . .	845	924	1,092	201.19	220.00	260.00
Angola . . . . .	743	754	882	176.90	179.52	210.00
Union of So. Africa . . . . .	704	740	862	167.62	176.19	205.24
Canada . . . . .	768	816	1,003	182.86	194.29	238.80
United States . . . . .	734	807	920	174.76	192.14	219.05
Peru . . . . .	640	-	890	152.38	-	211.90
Japan . . . . .	783	-	787	186.43	-	187.38
Country of Destination	Average Prices for Exports F.O.B. German Border Points					
	1959	1958	1957	1959	1958	1957
	DM Per Metric Ton	DM Per Metric Ton	DM Per Metric Ton	US\$ Per Metric Ton	US\$ Per Metric Ton	US\$ Per Metric Ton
Denmark . . . . .	741	774	892	176.43	184.29	212.38
Netherlands . . . . .	732	779	924	174.29	185.47	220.00
Austria . . . . .	-	-	1,198	-	-	285.23
Norway . . . . .	709	735	-	168.81	175.00	-
Sweden . . . . .	727	862	915	173.10	205.24	217.86
Total Production . . . . .	698	740	833	166.19	176.19	198.33

## German Federal Republic (Contd.):

the demand for fish oil by the margarine industries at home and abroad is expected to decline progressively, but also because foreign suppliers will probably step up their own production. Trade sources have pointed out that Russia is rapidly expanding its fisheries, and that it may ultimately buy less Norwegian fish oil. In that event, German producers would try to find a greater outlet in the home market. Moreover, increased competition is expected from less developed countries which cannot easily channel their growing fish catches into human consumption because of a lack of processing and distribution facilities. For these countries, the reduction of fish to oil and meal is the easiest way of utilizing their catches, and, according

to local trade sources, their low production costs can have a depressing effect on edible fish oil prices. (United States Consulate in Bremen, May 17, 1960.)

\*\*\*\*\*

## FUNDS FOR THE SUPPORT OF THE FISHING INDUSTRY:

Appropriations and expenditures by the West German Federal Government for the support of the commercial fishing industry amounted to DM17.2 million (US\$4.1 million) and DM10.7 million (US\$2.6 million), respectively, for the fiscal year ending March 31, 1960. Beginning with April 1, 1960, the fiscal year April-March was changed to a calendar year and funds amounting to DM13.2 million (US\$3.2 million) were appropriated for a transitional nine months period.

Appropriations and Actual Expenditures by the West German Government for the Support of the Fishing Industry, Fiscal Year 1959/60 and April-December 1960						
Purpose	Fiscal Year 1959/60 <sup>1/</sup>				Fiscal Year 1960 <sup>2/</sup>	
	Appropriations		Actual Expenditures		Appropriations	
	DM1,000	US\$1,000	DM1,000	US\$1,000	DM1,000	US\$1,000
(1) Subsidy on Diesel fuel used by luggers and cutters . . . . .	4,000	959	3,300	791	2,625	629
(2) Temporary special support program for the lugger and cutter fisheries in the form of medium term loans . . . . .	480	115	429	103	-	-
(3) Revolving loan fund to aid in the construction and modernization of cutters . . . . .	350	84	NA	NA	200	48
(Total amount of revolving fund) . . . . .	(5,000)	(1,199)	NA	NA	(5,200)	(1,247)
(4) Loans from the amortization of ERP investments in West Germany for the construction of factory trawlers . . . . .	6,000	1,439	NA	NA	5,200	1,247
(5) a. Subsidy of interest rates on commercial loans for the construction and modernization of luggers, cutters and factory trawlers . . . . .	400	96	355	85	225	54
b. Subsidy of interest rates on commercial loans for the building of central freezing and distribution facilities. . . . .	100	24	NA	NA	-	-
c. Subsidy of interest rates to avoid financial distress to trawler companies; forced to convert from interest-free to interest-bearing commercial loans . . . . .	100	24	NA	NA	-	-
(6) Management Advice Program for the cutter fishing trade . . . . .	100	24	91	22	150	36
(7) Search for and exploration of new fishing grounds and improvement of catching techniques . . . . .	800	192	NA	NA	830	199
(8) Contribution to the German Scientific Commission for the Exploration of the Seas, Bonn . . . . .	150	36	151	36	169	40
(9) Operation and maintenance of the fishery research vessel Anton Dohrn . . . . .	805	193	688	165	563	135
(10) Federal Fisheries Research Institute, Hamburg . . . . .	1,967	472	3/3,318	796	1,894	454
thereof: a. construction of a new building for the Institute <sup>3/</sup> . . . . .	(300)	(72)	3/1,383	(332)	(743)	(178)
b. construction of a new building for the Biological Institute, Helgoland <sup>4/</sup> . . . . .	-	-	3/627	150	-	-
c. testing of fish products . . . . .	(9)	(2)	NA	NA	(6)	(1)
(11) Operation and maintenance of the Federal Fisheries Policing and Protection Service, consisting of 3 vessels . . . . .	1,941	465	1,701	408	1,339	321
(12) Contribution to international organizations:						
a. International Council for the Exploration of the Seas, Copenhagen . . . . .	24	6	24	6	30	7
b. Overfishing Convention of 1946, London . . . . .	3	1	3	1	3	1
c. International Council for North Atlantic Fisheries . . . . .	10	2	9	2	17	4
Total . . . . .	17,230	4,132	10,697	2,565	13,245	3,175

1/April 1-March 31.  
2/April 1-December 31. In 1960 the German Government changed its fiscal year to a calendar-year basis, and the 1960 fiscal year became a transitional year covering a period of 9 months.  
3/Expenditures in excess of appropriations in 1959/60 were made possible by surplus funds from appropriations made in previous years.  
4/Total cost of the project: DM4,449,000 (US\$1,066,900).  
5/Total cost of the project: DM4,700,000 (US\$1,127,090).  
NA = Not available.  
Note: 4,170 Deutsche marks equal US\$1.

\*\*\*\*\*



## German Federal Republic (Contd.):

NEW TYPE CANNED FISH  
CONTAINER DEVELOPED:

A leading fishing and canning firm of Bremerhaven, West Germany, recently started selling its canned fishery products in a new type of container developed by a firm located in Hannover.

The innovation in this new type of container is the lid construction. Rather than soldering or crimping the lid on top of the can, the processor places it on a rubber ring fitted on the rim, and it is held in place by a partial vacuum. The procedure is similar to the way housewives preserve food in glass jars. The can is opened easily by pulling a small tongue attached to the rubber ring and protruding from under the top.

Containers of a similar construction have been on the German market for some time, but can be used only for fish products prepared with chemical preservatives and permit storage only for a short period. The Hannover firm succeeded in solving the problem of adapting the rubber ring to form a better seal that will last over a long-term storage period. Reportedly, a patent has been obtained on this invention.

Some experts were quoted as saying that the new container will revolutionize canning procedures, states a dispatch from the United States Consul in Bremen.



## Hong Kong

SHRIMP EXPORTS AND RE-EXPORTS,  
1952-1959 AND JANUARY-JUNE 1960:

Shrimp exports by Hong Kong to the United States reached a peak of about 4.1 million pounds in 1958 and dropped off rapidly in 1959 following the ban on shrimp imports from Hong Kong to the United States that be-

	Total Exports	Exports to U. S.	Total Re-Exports <sup>2/</sup>	Re-Exports to U. S.
		(1,000 Lbs.)		
January-June 1960	164.5	-	886.8	-
1959	828.0	514.4	2,013.0	-

<sup>1/</sup>Beginning January 1, 1959, shrimp are listed separately in export statistics.  
<sup>2/</sup>Includes shrimp imported into Hong Kong from Communist China and re-exported.

came effective on June 17, 1959. The ban on shrimp exported to the United States from Hong Kong was imposed because the Hong Kong shrimp exports included a large percentage of shrimp produced in Communist China.

	1958	1957	1956	1955	1954	1953	1952
			(1,000 Lbs.)				
Total	6,559.1	2,975.3	1,667.5	410.1	44.7	7.8	37.5
To United States	4,139.0	1,560.2	578.3	67.2	-	-	-

Note: Prior to January 1, 1959, exports of shrimp were included in basket category "crustacea and molluscs, fresh, chilled, and frozen."

In addition, the ban on shrimp exports from Hong Kong to the United States has affected the sale of shrimp landings through the Government Fisheries Marketing Organization. During April 1958-March 1959 more than 4.9 million pounds of shrimp were marketed through that Organization in contrast to only about 1.1 million pounds for the fiscal year ending March 31, 1960. Due to the export ban to the United States, most of the shrimp landed by Hong Kong fishermen or imported from Communist China by-passed the Marketing Organization and were sold in various large retail markets in Hong Kong and Kowloon.

Table 3 - Shrimp Sales Through Hong Kong's Fish Marketing Organization

April 1959-March 1960	April 1958-March 1959	June 1957-March 1958
	(1,000 Lbs.)	
1,149.1	4,930.5	3,864.4

It is estimated that Hong Kong shrimp fishermen are capable of landing about 4.5 million pounds (exclusive of shrimp from the China mainland). Most of this production is consumed locally and potential exports of Hong Kong-caught shrimp are estimated to be about 1 million pounds. (U. S. Consul in Hong Kong, September 22, 1960.)



## Iceland

EX-VESSEL PRICE FOR SOUTH  
COAST HERRING HIGHER:

The price to be paid by Icelandic processors to drift-net herring vessels for the south coast herring catch was announced September 21, 1960. The price is 1.80 Icelandic kronur per kilogram (2.15 U. S. cents a pound) for herring for salting and freezing, compared with 1.60 kronur (2 U. S. cents a pound) last year.

This increase will give a greater premium to processing of the catch for salting and

## Iceland (Contd.):

freezing rather than for rendering into meal and oil. The Herring Production Board has been criticized by the Communist press for not directing a larger proportion of the summer herring catch for salting. Some salted herring contracts with Eastern European countries could not be filled. It may be possible to complete certain of them with south coast herring.

\*\*\*\*\*

# FISHERIES TRENDS, SECOND QUARTER 1960:

Total landings from the Icelandic cod fisheries during the first half of 1960 increased to 198,246 metric tons from about 180,000 tons for the same period of 1959. The total catch of all species rose to 296,629 metric tons during the first half of 1960 from about 259,000 tons for the same period of 1959.

Table 1 - Icelandic Fishery Landings by Principle Species, January-June 1958-60

Species	January-June		
	1960	1959	1958
	(Metric Tons/)		
Cod	198,246	179,893	199,746
Haddock	17,776	10,403	13,147
Saithe	4,246	6,004	7,136
Ling	3,953	1,542	2,815
Wolfish (catfish)	6,639	7,697	8,351
Cusk	5,223	2,270	4,089
Ocean perch	18,002	42,740	18,399
Halibut	775	474	523
Flounders	402	497	498
Herring	39,732	6,104	24,675
Other	1,635	1,375	1,207
Total	296,629	258,999	280,586

1/Weights are gutted fish with heads on, except herring which are whole or round.

The value of the catch was up sharply due to better landings of the more valuable cod, haddock, and herring. The only notable decline was in the ocean perch landings. Ocean perch is a less valuable product per pound and is shipped mostly to the Soviet Union. The slump in the summer herring season was not registered until July, and was not reflected in landings for the first six months of 1960. The increase in cod landings was partly due to concentration on this kind of fishing and to the failure of the ocean perch fishery, as well as the good prices received by some trawlers in selling fresh cod and haddock on ice in England. The motor fishing vessels had relatively good fishing for cod in Icelandic waters, partly as a result of the general absence of foreign and Icelandic trawlers from the 12-mile limits area. Icelandic trawlers and motor boats benefit-

ed when British trawlers agreed to remain outside the 12-mile limit from the Law of the Sea Conference in May 1960 in Geneva until the middle of July and then until the middle of October.

During the January-June 1960 period there was a marked trend toward free world markets. A larger proportion of the catch was processed by air-drying and salting rather than freezing. The Soviet Union and satellites import frozen rather than dried and salted fish. Based on its estimate of the quality of the north coast herring catch, the Herring Production Board permitted only a relatively small proportion to be salted. The lion's share went for fish meal and oil, for which the world market prices are very low.

Table 2 - Icelandic Fishery Catch by Type of Vessel, January-June 1958-60

Type Vessel	January-June		
	1960	1959	1958
	(Metric Tons/)		
Motorboats	239,840	182,257	192,206
Trawlers	56,789	76,742	88,380
Total	296,629	258,999	280,586

1/All weights are of gutted fish with heads on, except herring which are whole.

The dramatic decline in the proportion of the landings by trawlers, as compared with the motorboats, continued during the first half of 1960 when the trawlers accounted for only 19.1 percent of the landings as compared with 29.6 percent during the first half of 1959, and 39.1 percent during the first half of 1958. The build-up by delivery of new vessels to both the trawler and motor boat fishing fleets continued during the quarter. There was also great activity in equipping the motor vessels for the north coast herring fishery with new nylon nets, new retrieving gear, and new electronic equipment, the United States Embassy in Reykjavik reported on September 30, 1960.



## India

### JAPANESE TO AID IN DEVELOPMENT OF FISHERIES:

Two fishery development projects to be undertaken with Japanese collaboration have been approved by the Indian Government for inclusion under the US\$50 million credit agreement between India and Japan signed on February 4, 1958. A large Japanese fishing company will collaborate with an Indian company in shrimp fishery operations at Cochin.

**India (Contd.):**

The second project involves a survey of the Mangalore coast in Mysore State. Other Japanese firms are reported to be negotiating with Indian companies for the formation of joint ventures for fishing operations, ice-making, cold-storage and canning plants, and the manufacture of fish nets.

The projects appear to be the direct outcome of India's increased interest in exploitation of the considerable fishery resources along the Indian coast and in the Indian Ocean and the resultant visit to Japan in March 1960 of a three-member team of Indian officials. The Japanese offers indicate that the conditions set down by the Indian Government for foreign participation in Indian fishery operations have not seriously handicapped negotiations for foreign collaboration. (United States Embassy, New Delhi, October 8, 1960.)

\*\*\*\*\*

**SHRIMP PRODUCTION AND FOREIGN TRADE, 1959:**

In 1959, India produced 27,632 metric tons of penaeid shrimp and 37,805 tons of non-penaeid shrimp.

The three most important varieties of fish and shellfish exported by India in 1959 were dry-unsalted "bomlas," dry-salted fish, and shrimp (frozen, dried, and canned). India's total shrimp exports were valued at 15 million rupees (US\$3.15 million) in 1959; the United States received an amount valued at 4.6 million rupees (US\$966,000), or 30.7 percent of the total and Burma came next with 4.3 million rupees (US\$903,000). The other principal countries buying shrimp from India in 1959 were Ceylon, Hong Kong, and France. (United States Embassy, New Delhi, October 5, 1960.)

**Israel****FISHING INDUSTRY SUFFERS REVERSES:**

The uncertain situation prevailing in the Israel's deep-sea fishing industry was underlined during August 1960 by the news that only 12 Israeli trawlers were operating in 1960 in the Mediterranean, as compared with about 24 in 1959. Several of the trawlers thus displaced were transferred to the Red Sea, and others were reportedly ear-

marked for fishing in the Persian Gulf. This will not prevent, however, at least three of the vessels from being laid-up entirely.

In view of the large sums invested during recent years in expanding and improving the local fishing fleet, and the fact that several additional trawlers are now on order abroad, this development calls for some explanation. A partial one is found in the recent suspension of fishing near Turkish waters, following a number of incidents involving the impounding of Israeli trawlers by Turkish coast-guard vessels on the grounds of their having entered Turkish territorial waters. But the fact must be faced that the Eastern Mediterranean as a whole is not over-endowed with fishery resources. Any further expansion of deep-sea fishing will thus be dependent on the dispatch of Israeli vessels to more distant grounds. Two large trawlers designed for ocean fishing on order were expected to arrive late in 1960.

A crucial consideration would appear to be the fact that, despite the large population increase in the interval, the total quantity of fish marketed in Israel fell by approximately 18 percent between 1954 and 1959. This marked decline in per capita consumption has not, of course, been the result of the development of a sudden aversion to fish as such, but of the improved food situation in general. In 1954, eggs, meat, poultry, and milk products were scarce and relatively expensive. Today the supply position has improved and prices are, with few exceptions, within the reach of all. The brunt of the decline in fish consumption has been borne by imports, which declined from some 15,000 tons in 1954 to under 7,000 tons in 1959. Well over half of these latter imports were her-ring in brine, i.e. were noncompetitive as far as the local fish landings are concerned. The total marketing in 1959 was about 19,500 metric tons and the importance of competitive imports (mainly frozen fillets) is negligible. Any large-scale increase in the local Israeli's landings will have to be taken up almost entirely, therefore, by increased per capita consumption. Whether such an increase in consumption can reasonably be anticipated must be regarded as at least a matter of conjecture.

Therefore, before any further decisions are taken involving the allocation of additional funds for investment in fisheries, a thorough study needs to be made of present and probable future demand for fish and fish products--

## Israel (Contd.):

against the background of known plans regarding agricultural production and the establishment of new food industries. Should such an investigation indicate the existence of potential additional demand, the next step would be to carry out a survey of likely fishing grounds and to estimate the economic future of long-range ocean fishing, taking into account both the transportation costs involved and the prices likely to be realized in the Israeli market. (The Israel Economist, August 1960.)



## Italy

FISH-BODY OIL PRICES  
AS OF SEPTEMBER 1960:

The September 1960 prices of the basic three types of fish-body oil (excluding whale oil and seal oil) which are of interest to the Italian Market are as follows according to a Genoa importer:

(a) Herring oil, straw-colored, filtered, 0.5 to 1 percent acidity: Norwegian kroner 150 per 100 kilos (about US\$210 a metric ton or 9.53 U. S. cents a pound), net weight c.i.f. Genoa (no charge for containers, i. e., steel drums).

(b) Not specified fish-body oil, light ruby colored, filtered, 10 percent acidity: Norwegian kroner 130 per 100 kilos (about US\$182 a metric ton or 8.26 U. S. cents a pound), net weight, c.i.f. Genoa (no charge for containers, i. e., steel drums).

(c) Not specified fish-body oil, dark ruby colored, filtered, 30 to 40 percent acidity: Norwegian kroner 90 per 100 kilos (about US\$126 a metric ton or 5.72 U. S. cents a pound), net weight, c.i.f. Genoa (no charge for containers, i. e., steel drums).

The Genoa importer stated that there are a great number of different kinds of fish-body oil which are imported, but gathering prices for all of them would be really impractical. Importers supply themselves generally from Norway.

The importer stated that in Italy no customs duties are levied on fish-body oils; however, he said that other costs should be taken into account to obtain the actual cost

at the Port of Genoa, for customs-cleared goods. Other costs are unloading expenses, freight-forwarder assistance cost, statistical duties, exchange tax, and other costs. In general, importers figure that the c.i.f. cost should be increased by 10 lire per kilo (about \$16.11 a metric ton), as an over-all estimate of such charges, the United States Embassy in Rome reported September 22, 1960.

\*\*\*\*\*

TUNA IMPORTS AND THE  
COMMON MARKET:

The present Italian import duty on fresh or frozen tuna is 20 percent on the invoice price. This product is listed under fresh and frozen fish (Italian Customs Item EX-03.01-B-1b). The proposed European Economic Community (EEC) or Common Market rate is 25 percent, the first step to achieve this rate to be effective December 31, 1960. In applying the 25-percent duty to each of the Common Market countries, the following formula is to be used:

1. If the national rate is within 15 percent of EEC's 25-percent rate, the national tariff will be increased or decreased to 25 percent.
2. If the national tariff is more than 15 percent of EEC's 25-percent rate, the national tariff shall be reduced or increased by 30 percent of the difference between the EEC duty and the national duty.

Revisions in national tariffs will be made every four years until the uniform EEC rate is attained. EEC, however, is planning to accelerate these revisions.

Italian officials, on the basis of Article 25, paragraph 3, of the Rome Treaty, had requested of the EEC Commission that it be given a duty-free quota, no limit, on imports of fresh and frozen tuna. This request was possible because tuna is listed in Annex II, G List, of the Treaty under agricultural products.

On March 2, 1960, an Accord was signed at Rome which would permit Italy to import "Sea Fish, Fresh, Refrigerated, or Frozen, whole, headed, or cut into pieces" free of duty, quantities unlimited. This Accord, in accordance with the Treaty's definition of customs duties relating to products on the "G" list, provides that EEC countries may ask authorization to import new lots of fish if it can be justified that the current trade in a product should be conducted in the traditional manner to the advantage of consumers and industries. In the case of tuna, the frozen product is required to provide Italian canning plants with raw materials.

The March 2 Accord has no termination date and is supposed to be effective December 31, 1960. At first France objected to the Accord but withdrew its objections and the Accord was signed. The Accord permits other countries of the EEC to apply to the Commission for a duty-free quota but so far no other countries have submitted a request.

Italian officials stated that the Accord cannot come into force, or the proposed 25-percent tariff applied, until new provisions for a common agriculture policy have been determined. Therefore, as far as Italy is concerned the 20-percent national duty on fresh and frozen tuna remains in force until such policy is determined.

Besides the import duty, Italy has a number of national taxes applied both to domestically-produced products and to imports of fresh or frozen tuna. These are as follows:

1. A 0.2-percent tax applied on the invoice price, this tax to be used for research.
2. A 0.05-percent tax for administration expenses.



## Italy (Contd.):

3. A 3.3-percent tax applied on all transactions. In effect this means that every time a product changes hands, this tax is collected both on imports and on domestically-produced tuna.

4. In the case of duty-free imports (as would be the case if the EEC Accord on fresh or frozen sea fish becomes effective), there would be a tax of 20 percent on the invoice price. Thus, the proposed duty-free tuna imports would be subject to a tax equivalent to the present import duty.

In the case of imports of canned tuna into Italy, the general rate is 40 percent, but this has been temporarily reduced to 27 percent. The proposed Common Market rate is to be 25 percent. According to a new decision of the EEC Council, the EEC duty will be reduced to 20 percent in order to foster increased international trade in this product. This decision was made May 11, 1960. It is proposed that the first reduction to achieve the uniform rate will be effective December 31, 1960, providing that (as in the case of fresh and frozen tuna) provisions for a common agriculture policy will have been determined.

Table 1 - Italy's Imports of Fresh and Frozen Fish<sup>1/</sup>, January-June 1960 and 1957-59

Origin	Quantity			
	Jan.-June 1960	1959	1958	1957
	(Metric Tons)			
Japan <sup>2/</sup> . . . . .	14,434	18,079	13,599	9,560
Other . . . . .	16,713	33,621	32,503	33,465
Total . . . . .	31,147	51,700	46,102	43,025
	Value			
	(US\$1,000)			
Japan . . . . .	4,115	5,205	3,591	2,873
Other . . . . .	6,485	10,395	11,878	11,689
Total . . . . .	10,610	15,600	15,469	14,562

<sup>1/</sup>Includes salt-water fish only and not otherwise specified.

<sup>2/</sup>Believed to be almost entirely frozen tuna.

Values in lire converted to US\$ at rate of 620.6 lire equal US\$1 for January-June 1960 and 1959, 624.0 lire equal US\$1 for 1958, and 624.89 lire equal US\$1 for 1957.

Since the Italian duty of 27 percent on canned tuna will eventually be reduced to 20 percent, the first reduction will be 30 percent of the difference between the present and the uniform rate, thus bringing the Italian duty down to 24.9 percent on December 31, 1960. The second 30-percent reduction is planned for four years later, but under the proposed acceleration plan it may come sooner.

Besides the research, administrative, and transaction taxes mentioned above for fresh and frozen tuna, there is a 65-lire tax on each kilogram (about 0.5 U. S. cents a pound) of oil in canned tuna.

Italian needs for tuna are estimated to be at least 20,000 metric tons annually. Italian production, however, has averaged only about 2,500 tons annually (2,877 tons in 1957, 2,985 tons in 1958, and 2,064 tons in 1959). The rest of the tuna supply comes principally from Japanese landings at Italian ports.

The price of the imported tuna, c.i.f. Italy, has ranged between 160 and 180 lire per kilogram (about US\$234-263 a short ton). Price as of September was about 177 lire per kilogram (about US\$259 a short ton) for frozen tuna.



## Japan

## EXPORTS OF CANNED TUNA (EXCLUDING TUNA IN BRINE), 1956-59:

Exports of canned tuna by Japan, exclusive of canned tuna in brine, in 1959 totaled 1,400,172 cases or about 25.7 percent higher than the average exports of 1,114,238 cases for the 1956-59 period. From 1956 to 1959 there was a sharp increase in exports of canned tuna in oil to "other" countries. In 1959, West Germany was Japan's best customer for canned tuna in oil, accounting for about 30 percent of the total. Canada and Switzerland were also important buyers of Japanese canned tuna in oil during the 1956-59 period.

Japanese Exports of Canned Tuna (Excluding Tuna in Brine) by Principal Destinations, 1956-59

	1959	1958	1957	1956
Exports by Country of Destination . . . . . (Cases)				
West Germany . . . . .	420,710	287,729	255,656	146,598
Canada . . . . .	155,869	148,888	141,927	130,330
Switzerland . . . . .	107,030	77,104	111,277	136,733
The Netherlands . . . . .	45,204	33,146	51,970	62,512
Belgium . . . . .	89,259	69,582	73,152	85,561
Britain . . . . .	74,740	58,051	73,765	23
Saudi Arabia . . . . .	72,335	50,146	52,082	24,234
Lebanon . . . . .	68,065	22,756	59,357	27,433
Italy . . . . .	46,280	37,330	152,486	77,653
Others . . . . .	320,680	156,574	249,472	203,234
Total . . . . .	1,400,172	941,306	1,221,144	894,331
Exports by type of product:				
In oil . . . . .	1,375,401	881,437	1,197,448	887,521
Other than oil or brine . . . . .	24,771	59,869	23,696	6,810

\* \* \* \* \*

## EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-MAY 1959-60:

Japanese Exports of Canned Fishery Products, January-May 1959-60

Product	1960 January-May			1959 Jan.-May
	United States	Canada	Other Countries	Total
	(Cases)			
Crab . . . . .	26,823	648	58,803	86,274
Tuna:				
In oil . . . . .	-	73,702	518,320	592,031
In brine . . . . .	802,039	-	-	802,039
Other . . . . .	100	2,251	29,130	31,481
Total Canned Tuna . . . . .	802,139	75,953	547,459	1,425,551
Mackerel-pike . . . . .	5,663	1,730	526,953	534,346
Sardine . . . . .	288	-	349,183	349,471
Salmon . . . . .	-	-	-	-
trout . . . . .	65,464	154	236,961	302,579
Other fish . . . . .	2,283	100	243,236	245,619
Shellfish . . . . .	106,185	25,973	19,010	151,168
Other aquatic products . . . . .	1,762	55	326	2,143
Total . . . . .	1,010,607	104,613	1,981,931	3,097,151

## Japan (Contd.):

Exports of canned fishery products by Japan during the first five months of 1960 amounted to 3,087,151 cases or about 1.0 percent less than the 3,129,939 cases exported in the similar period of 1959. In the first five months of 1960 exports of canned tuna (oil, brine, and other) were up 13.2 percent, but canned crab and salmon exports were down sharply as compared with the January-May 1959 period.

\*\*\*\*\*

### TUNA VESSELS OPERATING IN THE ATLANTIC OCEAN:

About 50 Japanese tuna vessels were operating in the Atlantic Ocean as of September 1960, and half of them transship their catches to the United States and Italy in addition to Yugoslavia and other countries. The Japanese Fisheries Agency intends to adjust tuna exports to Yugoslavia. Accordingly, future exports to Yugoslavia will be based on what that country alone can consume or use. (Fisheries Economic News, September 17, 1960.)

\*\*\*\*\*

### IMPORT RESTRICTIONS REMOVED ON SOME FISHERY AND RELATED PRODUCTS:

The Japanese Ministry of International Trade and Industry on September 22, 1960, published a list of 74 commodities to be placed under the Automatic Approval and Automatic Fund Allocation Systems on October 1, 1960. This new list covers agricultural and aquatic products and is intended as a supplement to an earlier list of 257 items of a more general nature scheduled for inclusion on the same date.

Included in the list are the following fishery and related products: frog meat, fresh, chilled or frozen; breeding fish; fish roe, live; fish, live, n.e.s.; rainbow trout, fresh, chilled or frozen; abalone, fresh, chilled or frozen; abalone, salted or dried; seed oysters; oysters, fresh, chilled or frozen; oysters, salted or dried; crustacea, molluscs and the like, for breeding purposes (excluding oyster seed); crustacea, molluscs and the like, live (excluding for breeding purposes); fish, fish products, and fish preparations in airtight containers (including crustacea and molluscs but excluding salmon eggs); and fish rods of bamboo. (United States Embassy in Tokyo, September 28, 1960.)

\*\*\*\*\*

### MARINE-OIL EXPORTS AND CONSUMPTION, 1958-59:

Total exports of marine-oils during 1959 by Japan amounted to 103,564 metric tons and are expected to increase to about 117,460 tons in 1960 (see table 1).

Type	1960 <sup>1</sup> /	1959
... (Metric Tons) ...		
<b>Edible:</b>		
Cod-liver oil .....	1,520	1,368
Shark-liver oil .....	80	104
Fish-liver oil .....	1,600	1,338
Fish oil .....	260	482
Whale oil .....	90,000	81,280
<b>Total .....</b>	<b>93,460</b>	<b>84,572</b>
<b>Inedible:</b>		
Sperm oil .....	24,000	18,992
<b>Grand Total .....</b>	<b>117,460</b>	<b>103,564</b>

The larger part of Japan's production of marine oils is exported in the form of whale oil; however, considerable amounts of whale oil and fish oil are used in the domestic pro-

Type	Margarine & other Processing	Manuf-cturing In-dustry	Domestic Consump-tion	Exports	Total Produc-tion
... (Metric Tons) ...					
Whale oil	14,200	2,300	16,500	90,370	106,870
Fish oil	26,600	11,800	38,400	2,850	41,250
Sperm oil	-	33,300	33,300	1,600	34,900
<b>Totals</b>	<b>40,800</b>	<b>47,400</b>	<b>88,200</b>	<b>94,820</b>	<b>183,020</b>

duction of margarine. Inedible sperm oil is used extensively by other industries (see table 2). (U. S. Foreign Agricultural Service Report, September 28, 1960, Tokyo.)

\*\*\*\*\*

### SALMON SHARK EXPORTS TO ITALY INCREASE SHARPLY:

Japanese salmon shark ("porbeagle") exports to Italy have increased sharply since last year. As of mid-September 1960, exports since January 1, 1960, had reached more than 1,000 metric tons, almost twice as much as last year. The price is \$320 a metric ton c.i.f., the same as last year. Although there are certain problems with quality, further expansion is expected if the quality of the product improves, since demand in the Italian market is estimated to be 2,000 tons a year.

The exports are used for steaks and the Japanese industry is said to be expecting much from this new product of the Kesen-numa area in Miyagi Prefecture.

## Japan (Contd.):

When the first order was received from Italy in 1957, exports were limited to about 50 tons a year under the agreement to ship salmon shark in return for Italy's rice and mercury exports, but later orders gradually increased.

This species of shark is abundant during the summer months and was previously bought by the Japanese makers of paste products almost at the buyer's price. This year, however, Japanese manufacturers were forced to pay the same prices that Italian importers paid and there is even a tendency for a shortage. More than 50 percent of the salmon shark caught on the Sanriku fishing grounds are landed at Kesennuma, and freezing the shark has become an important industry in that area. (*Fisheries Economic News*, September 21, 1960.)



## Mexico

## FOREIGN TRADE IN MARINE OILS:

Table 1 - Mexico's Imports of Marine Oils,  
January-July 1959-60

Item and Origin	Jan.-July 1960	Jan.-July 1959
	... (Metric Tons) ...	
<b>Fish Liver Oils:</b>		
United States .....	-	-
Norway .....	70	81
Great Britain .....	-	7
<b>Total .....</b>	<b>70</b>	<b>88</b>
<b>Cod Oils:</b>		
United States .....	74	44
Norway .....	289	208
Great Britain .....	-	6
Germany .....	6	-
<b>Total .....</b>	<b>369</b>	<b>258</b>
<b>Whale Oils:</b>		
United States .....	33	18
Great Britain .....	36	4
Germany .....	15	8
Norway .....	18	13
Italy .....	-	3
<b>Total .....</b>	<b>102</b>	<b>46</b>
<b>Fish Oils, Other:</b>		
United States .....	0.3	13
Great Britain .....	3.0	11
Norway .....	2.0	15
Other Countries .....	0.4	-
<b>Total .....</b>	<b>6.0</b>	<b>39</b>
<b>Total all Oils .....</b>	<b>547</b>	<b>431</b>

**Exports:** During the first seven months of 1959 Mexico exported 75 metric tons of whale oil and 327 tons of fish oil to the United States, as compared with 68 tons of whale oil and 33 tons of fish oil for the same period of 1960. This represents a decline of 25.1 percent in volume of marine oils exported to the United States. The United States was the only buyer for Mexico's whale and fish oil.

**Imports:** Mexico's imports of marine oils from all countries increased from 431 tons during the first seven months of 1959 to 547 tons for the same period in 1960. Imports of cod oil and whale oil from the United States increased, while imports of other fish oils from the United States declined (see table 1). (U. S. Foreign Agricultural Service Report, Mexico City, September 30, 1960.)

\*\*\*\*\*

SHRIMP FISHERY TRENDS,  
MID-SEPTEMBER 1960:

The price dispute between the shrimp fishermen's cooperative and the vessel owners at the Gulf of Mexico port of Ciudad del Carmen was settled on September 16, 1960. Separate agreements at other shrimp fishing ports or areas were reached earlier in the month. The agreements are for two years and expire on August 31, 1962.

Increases of 160 pesos per metric ton of headless shrimp (about 0.58 U. S. cents a pound) were agreed to for the west coast ports of San Felipe, Baja California, and Mazatlan, Sinaloa. The Guaymas price increased 225 pesos (about 0.82 U. S. cents a pound). In the above ports the increases cover all sizes of shrimp.

A new system, which has been prevailing in Ciudad del Carmen and Campeche, was introduced at Salina Cruz, Oaxaca. This consists in paying the fishermen more for large than for small shrimp. Shrimp counting 30 to the pound headless and under are considered large and 31 count and over are small. The fishermen will receive 3,500 pesos per metric ton (US\$280 a ton or 12.7 U. S. cents a pound) for large shrimp and 2,265 pesos a metric ton for small (US\$181.20 a metric ton or 8.2 cents a pound). However, if the ex-vessel or price to the boat for small shrimp is more than 9,300 pesos a metric ton (\$744 a ton or 33.8 cents a pound), the same price (3,500 pesos or \$280 a ton) will be paid for small as for large shrimp.

At Ciudad del Carmen and Campeche changes consisted in the dropping of one deckhand; a lesser amount paid for small shrimp; an increase in the amount paid for large shrimp; an increase in food allowance, and fixed daily wages for the crew while a boat is on the ways for repairs.

The Gulf of California shrimp fleets, on the opening of the season on September 16, left the various ports and were not expected back until the latter part of the month.

Salina Cruz landings were reported to have improved somewhat. Boats were said to be landing around two tons per trip. Prices to vessel owners dropped during August.

During the last half of August, Carmen and Campeche landings improved. At Carmen they averaged around 2,000 pounds a trip and about 1,750 pounds at Campeche. This increase in size of landings reflected a change in species composition. At Carmen during the first half of the month about 50 percent of the shrimp were pink, 30 percent white, and 20 percent brown. This changed during the second half to about 40 percent white, 35 percent pink, and 25 percent brown. At Campeche the landings ran about 90 percent pink, 8 percent brown, and 2 percent white during the first half of August; and about 98 percent pink and 1 percent each white and brown during the second half of the month.

Shrimp sizes at Carmen did not vary much during August. They were about equally divided throughout the month between 30 per pound (headless) and under and 31 count and over. At

## Mexico (Contd.):

Table 1 - Distribution of Crew's Share and Cooperative's Share for Mexican Gulf of Mexico Shrimp Vessels

Item	After September 16, 1960				Prior to September 16, 1960			
	Large Shrimp		Small Shrimp		Large Shrimp		Small Shrimp	
	Pesos Per Metric Ton	US\$ Per Metric Ton	Pesos Per Metric Ton	US\$ Per Metric Ton	Pesos Per Metric Ton	US\$ Per Metric Ton	Pesos Per Metric Ton	US\$ Per Metric Ton
<b>Crew's Share:</b>								
Captain .....	850	68.05	360	28.82	700	56.04	362.6	29.02
Engineers .....	650	52.04	310	24.82	500	40.03	312.5	25.02
Winchman .....	400	32.03	240	19.22	350	28.02	240.0	19.22
Cook .....	400	32.03	220	17.61	330	26.42	210.0	16.81
Hand .....	-	-	-	-	330	26.42	210.0	16.81
<b>Total .....</b>	<b>2,300</b>	<b>185.15</b>	<b>1,130</b>	<b>90.47</b>	<b>2,210</b>	<b>176.93</b>	<b>1,335.0</b>	<b>106.88</b>
<b>Cooperative's Share:</b>								
Severance tax	220	17.61	220	17.61	220	17.61	220.0	17.61
Administration	200	16.01	200	16.01	200	16.01	200.0	16.01
<b>Total .....</b>	<b>420</b>	<b>33.62</b>	<b>420</b>	<b>33.62</b>	<b>420</b>	<b>33.62</b>	<b>420.0</b>	<b>33.62</b>
<b>Grand Total ..</b>	<b>2,720</b>	<b>217.77</b>	<b>1,550</b>	<b>124.09</b>	<b>2,630</b>	<b>210.55</b>	<b>1,755.0</b>	<b>140.50</b>

Table 2 - Payments Other Than Shares by Mexican Gulf of Mexico Vessel Owners

Item	September 16, 1960			
	After		Prior	
	Pesos	US\$	Pesos	US\$
Food, per-man-per-day .....	9	0.72	8	0.64
Social Security, per-boat-per-month .....	1/500	40.03	1/500	40.03
Wages per-day while vessel under repair:				
Captain .....	25	2.00	2/	2/
Engineer .....	20	1.60	2/	2/
Winchman .....	15	1.20	2/	2/
Cook .....	15	1.20	2/	2/
1/Ciudad del Carmen boat owners will pay 400 pesos per-boat-per-month until Social Security is inaugurated at this port at which time they will pay 500 pesos.				
2/Individual arrangements with boat owners.				

Table 3 - Ex-Vessel Shrimp Prices Early September 1960 At East and West Coast Mexican Ports

Size (No. heads-off shrimp per lb.)	Carmen-Campeche (All species)	Salina Cruz (Brown only)
	.....(U. S. Cents Per Lb.).....	
Under 15 .....	58-61	48
15-20 .....	55-60	48
21-25 .....	49	38
26-30 .....	45	34
31-35 .....	40-42	-
31-40 .....	-	24
36-40 .....	35-36	-
41-50 .....	30-31	20
51-65 .....	25-26	-
61 and over ...	-	15

Campeche sizes decreased from about 80 percent 30 count and under during the first half to about 60 percent during the second half. (United States Embassy, Mexico City, September 20, 1960.)

1/These payments represent the net share for the crew and not the prices paid the vessel (ex-vessel prices).

\* \* \* \* \*

## WEST COAST SHRIMP FISHERY TRENDS:

The closed season on shrimp fishing in the Guaymas area ended on September 1, 1960, for inshore areas and on September 15 for deep-sea fishing. The landings for the first months following the closed season are usually good, with production falling off just prior to the next closed season. First reports indicate that shrimp production this year will follow the established pattern.

Shortly before the opening of the new shrimp season the fleet owners and the co-operatives reached an understanding and signed an agreement governing their relationships for the next two years.

The shrimp season in the Mazatlan area for deep-sea fishing opened on October 1, 1960. The season in shallow-water shrimp fishing in that area opened early in September with catches in the areas north of Mazatlan reported "good" and the areas to the south "fair." (United States Consulate in Nogales, October 3, 1960.)





## Netherlands

### BILLS PASSED APPROVING WITHDRAWAL FROM WHALING CONVENTION AND REGULATING ANTARCTIC WHALING:

The Netherlands First Chamber on September 27, 1960, approved bills endorsing the Netherlands' withdrawal from the International Whaling Convention and giving the Government the authority to issue regulations governing whaling by Dutch vessels.

During debate on the first bill, the Minister of Agriculture rejected the suggestion from a Labor Party member that the Netherlands follow Norway's example and rejoin the Convention. He reportedly said that the Dutch position of waiting until its conditions had been met before rejoining was "more realistic" than the Norwegian course of rejoining subject to conditions.

Passage of the 1960 Whaling Act enables the Netherlands Government to ensure that the Netherlands Whaling Company observes such provisions of the Convention and Schedule to the Convention as the Government may desire. (United States Embassy, The Hague, September 29, 1960.)

Note: Also see Commercial Fisheries Review, Oct. 1960, p. 75.



## Norway

### FISH MEAL PRODUCTION, 1958-60:

In 1958, Norway's total fish-meal production amounted to 118,900 metric tons of which 100,000 tons were herring meal. In 1959 fish-meal production totaled 128,000 tons, of which 110,000 tons were herring meal and 18,000 tons of other fish meal. As of July 1960, the Norwegian herring catch had been poor--total estimated production of herring meal for 1960 is only 70,000 tons. (U. S. Foreign Agricultural Service Report, July 27, 1960, Copenhagen).

\*\*\*\*\*

### FOREIGN TRADE AND PRODUCTION OF MARINE OILS, 1956-1960:

Production: Norway's total production of marine-animal oils was 203,720 metric tons in 1959, or about the same as the 201,981 tons produced in 1958. The estimated production of marine oils in 1960 indicates a drop of about 20 percent to 164,000 tons (table 1).

Table 1 - Norway's Production of Marine Oils, 1956-60

Type	1960 <sup>1/</sup>	1959	1958	1957	1956
	(Metric Tons)				
Cold-cleared cod-liver oil . . .	15,000	15,900	11,900	10,300	12,400
Other fish-liver oils . . .	1,400	1,400	4,600	3,700	4,500
Herring oil . . . . .	26,000	40,000	34,000	67,424	110,828
Total Fish Oils . . .	42,400	57,300	50,500	81,424	127,728
Seal oil . . . . .	5,000	4,500	5,500	4,700	5,000
Sperm Oil:					
Antarctic . . . . .	10,947	15,097	20,751	16,874	22,569
Norwegian shore stations . . . . .	400	216	672	227	469
Total Sperm Oil . . .	11,347	15,313	21,423	17,101	23,038
Whale Oil:					
Antarctic . . . . .	104,387	125,480	123,946	153,167	121,898
Norwegian shore stations . . . . .	800	1,127	612	769	649
Total Whale Oil . . .	105,187	126,607	124,558	153,936	122,547
Grand Total . . . . .	163,934	203,720	201,981	257,161	278,513

<sup>1/</sup>Forecast.

The nine Norwegian Antarctic pelagic expeditions and the one Norwegian shore station at Husvik Harbor produced 125,480 tons of whale oil and 15,097 tons of sperm oil during the 1958/59 season, a decline from the previous season. Preliminary results from the 1959/60 season indicate a further reduction of 18 percent in whale oil and sperm oil production since only 104,387 tons of whale oil and 10,947 tons of sperm oil were produced (table 2). The Norwegian production of whale and sperm oil from the 1958/59 Antarctic season was sold, as usual, through the Norwegian whaling companies' common marketing pool.

Table 2 - Norwegian Production of Whale and Sperm Oil, 1959-60

Area and Year	Whale Oil	Sperm Oil	Total
	(Barrels) <sup>1/</sup>		
<u>Pelagic Production, Antarctic:</u>			
1959/60 <sup>2/</sup> . . . . .	588,450	63,438	651,888
1958/59 <sup>3/</sup> . . . . .	712,884	84,502	797,386
1957/58 . . . . .	732,106	122,569	854,675
1956/57 . . . . .	857,326	98,273	955,599
1955/56 . . . . .	657,872	131,517	789,389
<u>Husvik Harbor, South Georgia:</u>			
1959/60 <sup>2/</sup> . . . . .	25,230	920	26,150
1958/59 <sup>3/</sup> . . . . .	24,799	4,252	29,051
1957/58 <sup>4/</sup> . . . . .	-	-	-
1956/57 . . . . .	47,381	1,393	48,774
1955/56 . . . . .	62,141	1,787	63,928
<u>Shore Stations in Norway:</u>			
1959 <sup>2/</sup> . . . . .	6,626	1,271	7,897
1958 <sup>3/</sup> . . . . .	3,598	3,951	7,549
1957 . . . . .	4,525	1,337	5,862
1956 . . . . .	3,834	2,930	6,764
1955 . . . . .	6,158	1,830	7,988

<sup>1/</sup>One long ton equals 6 barrels.

<sup>2/</sup>Preliminary.

<sup>3/</sup>Revised.

<sup>4/</sup>Not in operation.

Herring oil production in 1959, although not as poor as in 1958, was still far below the average for preceding years. Only about 40,000 tons of herring oil were produced in

## Norway (Contd.):

1959. In 1960, however, the catches of herring as well as deliveries to the oil and meal factories were lower than for many years, and the oil production may only reach 26,000 tons. But since the late start of the 1960 herring fishing suggests a lower fat content, the 1960 production may be less than 26,000 tons.

Production of fish-liver oils rose from 16,500 tons in 1958 to 17,300 tons in 1959. On the other hand, seal-oil production (varies between 4,000 and 5,000 tons annually) dropped slightly in 1959 to about 4,500 tons.

Norwegian whale oil from the 1958/59 Antarctic season was sold at prices varying from £72 10s. to £78 (US\$203 to \$218.40) a long ton. The average price was £73 2s. 4d. (\$204.73) a long ton as compared with £72

**Exports:** During 1958 and 1959 Western Germany and the United Kingdom were the principal receivers of Norwegian Antarctic whale and sperm oil. Total whale and sperm oil exports remained relatively stable during that period (see table 2).

Norway's exports of all marine oils and byproducts continued stable during 1958-59 (see table 3). The bulk of these exports was crude whale oil and edible marine-animal oils.

**Imports:** Norwegian imports of marine oils increased from 15,713 metric tons, valued at US\$3.4 million, in 1958, to 55,766 tons, valued at US\$10.7 million, in 1959 (see table 4). Increase was due chiefly to larger imports of crude herring oil from Western Germany and menhaden oil from the United States.

**Stocks and Utilization:** From 1956 to 1959 Norway augmented her lower production of

Table 3 - Norwegian Exports of Marine Oils and Byproducts, 1958-59

Products	Quantity		Value			
	1959	1958	1959	1958	1959	1958
	(Metric Tons) . .		.. (Kr. 1,000) . .		.. (US\$1,000) . .	
Whale oil, crude <sup>1/</sup> . . . . .	92,719	95,099	131,421	135,911	18,399	19,000
Whale, sperm and bottlenose oil . . . . .	13,408	14,353	14,890	19,719	2,085	2,757
Herring oil, crude . . . . .	625	240	666	307	93	43
Seal oil, crude . . . . .	3,248	4,144	4,434	5,786	621	809
Fish-liver oils . . . . .	18,444	17,763	33,503	34,429	4,690	4,813
Refined marine oils, edible . . . . .	1,026	1,661	1,868	3,330	262	465
Refined marine oils, other . . . . .	3,259	1,252	3,621	1,946	507	272
Marine-animal oils, polymerized, oxidized, etc., edible . . . . .	678	592	1,223	1,134	171	159
Hardened fats from marine-animal oils, edible . . . . .	44,651	39,469	85,111	77,735	11,916	10,867
Hardened fats from marine-animal oils, for technical use . . . . .	8,329	7,503	14,137	12,657	1,979	1,769
Fatty acids from marine oils and products from sperm and bottlenose oils . . . . .	8,056	4,221	14,239	10,126	1,994	1,416
Other products . . . . .	777	2,238	1,531	4,465	214	624
Total . . . . .	195,220	192,546	306,644	314,219	42,931	43,927

<sup>1/</sup>Includes deliveries from Antarctic expeditions.

Note: Values computed at rate of: 1959 - one krone equals US\$0.1400; 1958 - one krone equals US\$0.1398.

(\$203) a long ton the preceding season. The average price for the 1958/59 season production for sperm oil was £50 1s. 3d. (\$140.17) a long ton as compared with £64 19s. 9d. (\$181.96) a long ton for 1957/58 season production.

marine oils by drawing on stocks (table 5). Almost all marine oils are consumed in the form of hardened fats as raw material for the margarine industry. The use of hardened marine oils by the Norwegian margarine industry increased from 52,681 metric tons

Table 4 - Norwegian Imports of Marine Oils, 1958-59

Type	Quantity		Value			
	1959	1958	1959	1958	1959	1958
	(Metric Tons) . .		.. (Kr. 1,000) . .		.. (US\$1,000) . .	
Whale oil, crude . . . . .	5,432	2,326	8,579	3,798	1,201	531
Sperm and bottlenose, oil, crude . . . . .	50	589	59	731	8	102
Herring oil, crude . . . . .	39,478	6,632	49,752	8,352	6,965	1,168
High-potency (vitamin A) oil . . . . .	961	919	6,425	5,610	900	784
Cod-liver oil . . . . .	521	-	785	-	109	-
Veterinary fish-liver oil . . . . .	1/	5	1	3	2/	2/
Industrial fish-liver oil . . . . .	7,125	4,548	9,698	5,280	1,358	738
Residual fish-liver oil . . . . .	2,199	694	1,139	538	160	75
Total . . . . .	55,766	15,713	76,438	24,312	10,701	3,399

<sup>1/</sup>Less than one-half ton.

<sup>2/</sup>Less than US\$1,000.

## Norway (Contd.):

Table 5 - Norwegian Stocks of Marine Oils, 1956-59				
Type	Quantity			
	As of December 31			
	1959	1958	1957	1956
	(Metric Tons)			
Herring and whale oil, crude	38,459	44,580	71,764	67,981
Other marine oils	198	311	355	439
Total	38,657	44,891	72,119	68,420

in 1958 to 57,091 tons in 1959. (U. S. Foreign Agricultural Service Report, July 27, 1960, Copenhagen.)

\*\*\*\*\*

#### CONDITIONAL READHERENCE TO INTERNATIONAL WHALING CONVENTION ANNOUNCED:

On September 23, 1960, the Norwegian Government announced that it intended to readhere to the International Whaling Convention but that it would not be able to continue to adhere to the agreement unless (1) the Netherlands returns to the Convention; (2) the U. S. S. R. catch does not exceed 20 percent of the total whale quota; and (3) the other whaling nations reach agreement on the distribution of the remaining 80 percent of the total quota. (United States Embassy in Oslo, September 30, 1960.)

\*\*\*\*\*

in their share of the proceeds of whaling operations, and pay for Sunday work. The increase altogether would amount to 7-8 percent. Balloting on the agreement was light, but a clear majority voted in its favor, the United States Embassy in Oslo reported on September 30, 1960.



## Peru

#### EXPORTS OF MARINE PRODUCTS, JANUARY-JUNE 1959 AND 1960:

Exports of principal marine products by Peru during January-June 1960, amounted to 322,156 metric tons (valued at US\$29.9 million)--up almost 109.2 percent in volume and 47.7 percent in value from the 153,975 tons (valued at US\$20.2 million) exported in the first six months of 1959. Exports of 285,503 tons of fish meal (valued at US\$23.9 million) were higher by 131.0 percent in quantity and 64.5 percent in value in the first half of 1960 as compared with the same period of 1959. The average export value of fish meal per metric ton during the first six months of this year was only \$83.70 a metric ton--down sharply from the average price of \$117.52 a ton during January-June 1959. Fish oil exports also increased substantially (up 92.2 percent in quantity and 120.1 percent in value)

Peruvian Exports of Principal Marine Products, January-June 1959 and 1960									
Marine Products	2nd. Quarter 1960			January-June 1960			January-June 1959		
	Qty.	Value 1/		Qty.	Value 2/		Qty.	Value 2/	
	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000
Fish meal .....	137,412	300.6	10,899	285,503	660.8	23,899	123,580	390.7	14,524
Fish (frozen, canned, etc.) ...	8,243	50.8	1,842	16,776	106.6	3,855	17,208	116.4	4,327
Fish oil .....	8,272	24.5	888	13,175	32.2	1,382	6,926	16.9	628
Sperm oil .....	473	1.6	58	5,281	17.5	633	4,031	13.6	506
Whale meal .....	-	-	-	308	0.5	18	1,825	5.4	201
Fertilizer (guano) .....	-	-	-	1,114	2.5	90	405	1.0	37
Total .....	154,400	377.5	13,687	322,156	826.1	29,877	153,975	544.0	20,223
1/F. o. b. values, converted at rate of 27.58 soles equal US\$1 for 2nd Quarter of 1960.									
2/F. o. b. values, converted at rate of 27.65 soles equal US\$1 for first half of 1960 and 26.90 soles equal US\$1 for first half of 1959.									

#### WHALING CREWS RECEIVE WAGE INCREASE:

Crews of Norwegian whaling vessels have voted to accept a wage agreement negotiated on their behalf by the Seamen's Union with employer representatives, with the assistance of voluntary mediators. The crews are to receive a 5 percent increase in wages and

this January-June from the first six months of 1959.

\*\*\*\*\*

#### FISHING VESSEL FLEET AS OF JULY 1960:

As of July 1960 some 2,018 Peruvian-flag vessels and 113 United States-flag ves-

## Peru (Contd.):

sels were engaged in commercial fishing in Peruvian waters. Excluding rowboats and vessels with sails from the total number of vessels, there were 991 motor-powered Peruvian-flag vessels and 113 United States-flag vessels engaged in commercial fishing.

Total Number of Vessels Engaged in Commercial Fishing in Peruvian Waters			
Vessel Type	Number of Vessels		Type of Equipment Used
	Peruvian Flag	U. S. Flag	
Purse seiners	445	5	Nylon nets, 200-500 fathoms, by 5 fathoms in depth
Bonito vessels (Boniteros)	185	-	Nets of 20-30 fathoms by 5 fathoms in depth
Tuna clippers	-	108	Pole-and-line fishing & fishing for bait
4-ton vessels for various types of fishing	354	-	Hook-and-line & trawls
Whaling vessels	7	-	Harpoons
Rowboats	77	-	Nets & hook-and-line
Sailboats	950	-	Nets & hook-and-line
Total	2,018	113	

This number compares with an estimated 700 motor-driven fishing craft in operation in 1957 and an estimated 800 powered domestic fishing vessels engaged in fishing operations as of December 31, 1958, the United States Embassy in Lima reported on September 23, 1960.



## Philippines

## CANNED FISH RETAIL AND WHOLESALE PRICES, MAY 3-JULY 1, 1960:

Retail and wholesale prices, May 3-July 1, 1960, for canned sardines and canned salmon in Manila were:

Product	Wholesale US\$/cs	Retail US\$/Can
Canned sardines:	(48 15-oz. Cans)	
U. S. brand . . . . .	11.25-12.00	27.5-32.5
Japan brand . . . . .	10.50-10.90	25.0-27.5
Canned salmon:	(48 16-oz. Cans)	
U. S. brand . . . . .	1/	57.5-80.0
Other imported brands	1/	65.0-85.0

1/No quotations.



## Portugal

## CANNED FISH EXPORTS, FIRST HALF 1960:

Portugal's exports of canned fish during the first half of 1960 amounted to 25,994 metric tons. Sardines comprised the bulk of these exports with 85.6 percent of the total, followed by anchovy fillets (7.9 percent).

Portuguese Canned Fish Exports, First Half 1959 and 1960			
Product	January-June		1959
	1960	1959	
	... (Metric Tons <sup>1/</sup> ) ...		
In Oil or Sauce:			
Sardines . . . . .	22,244	24,819	
Chinchards . . . . .	412	24	
Tuna & tuna-like . . . . .	997	1,184	
Anchovy fillets . . . . .	2,062	3,296	
Mackerel . . . . .	125	2,032	
Others . . . . .	154	1,295	
Total . . . . .	25,994	32,626	

1/Case data not available.

2/Probably included in others.

During this period Portugal's most important canned fish buyers were Germany with 5,752 tons followed by England with 3,450 tons, the United States with 3,064 tons, Italy with 2,276 tons, France with 1,947 tons, and Belgium-Luxembourg with 1,670 tons. (Conservas de Peixe, July and August, 1960.)

\*\*\*\*\*

## CANNED FISH PACK, FIRST HALF 1960:

The Portuguese pack of canned fish, in oil or sauce, for the first half of 1960 amounted to 11,809 metric tons or 669,000 cases. Sardines accounted for the bulk of the pack with 51.8 percent of the total; tuna and tuna-like fish followed with 24.8 percent. (Conservas de Peixe, August 1960.)

Portuguese Canned Fish Pack, First Half 1959 and 1960				
Product	January-June			
	1960		1959	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines . . . . .	6,114	322	5,200	273
Sardine-like fishes . . . . .	-	-	468	24
Chinchards . . . . .	288	15	-	-
Mackerel . . . . .	119	4	185	7
Tuna and tuna-like . . . . .	2,934	104	2,691	96
Anchovy fillets . . . . .	2,119	212	3,257	325
Others . . . . .	235	12	524	27
Total . . . . .	11,809	669	12,325	752

\*\*\*\*\*

## FISHERIES TRENDS,

## SECOND QUARTER 1960:

During the second quarter of 1960, Matasinhos was the leading sardine fishing port



## Portugal (Contd.):

in Portugal. Sardine landings improved during the early part of the quarter in central and southern Portuguese coastal cities, such as Setubal, Lagos, and Portimao. Some concern was expressed by the canners for the higher sardine ex-vessel prices during May and June, and a possible adverse effect on canned fish exports.

Sardine landings for January-June 1960 amounted to 20,479 metric tons. In addition, there were landings of 1,043 tons of anchovy and 9,763 tons of chinchard. Other species landed, for which data are available only for January-May 1960, were 690 tons of tuna, 89 tons of mackerel, and 32 tons of bonito.

Portuguese canned fish exports declined by 5,695 metric tons when compared with the second quarter of 1959, mostly due to a noticeable drop in sardine exports; likewise, the canned fish pack declined by 622 tons. (*Conservas de Peixe*, June through August 1960.)



## Spain

## BALEARIC ISLANDS SHRIMP FISHERY:

Many species of shrimp are caught by Spanish fishermen, mostly by trawling. The white shrimp (*Parapenaeus longirostus*) constitute the principal source of income for the smaller vessels that fish in the southern part of Spain. This species is little known in the Balearic Islands in the Mediterranean.

The pink shrimp (*Aristeus antennatus*) and the "chorizo" shrimp (*Aristeomorpho foliaceo*) are the two principal species that the fishing fleet catches in the Balearic Islands and part of the Levant area. Each species is found in its own area and depth zone.

The shrimp fishing fleet of the port of Palma, in the Balearic Islands, leaves port early (about 1:00 a.m.) daily. The vessels stay out fishing until the early afternoon and usually make two drags.

The shrimp, after being brought aboard, are sorted from the small fish and trash, and packed in boxes with ice.

Since the initiation of shrimp fishing at greater depths in 1948, shrimp landings in the Balearic Islands have increased.

Shrimp Landings in the Balearic Islands (Spain), 1948-58 <sup>1</sup>	
Year	Quantity
	Metric Tons
1958	309.4
1957	177.3
1956	154.4
1955	145.9
1954	116.9
1953	121.1
1952	94.9
1951	69.5
1950	53.9
1949	18.9
1948	16.2

<sup>1</sup>Does not include shrimp caught in waters adjacent to the Balearic Islands but landed in other ports.

Shrimp landings in the Balearic Islands are at their peak in late summer, and with exception of the winter months, landings are good.



## U. S. S. R.

## NEW FREEZER-FACTORYSHIP COMPLETED:

A Leningrad, U. S. S. R., shipyard has delivered a new combination freezer-factoryship, according to the August 17, 1960, issue of *Leningradskaja Pravda*. The 10,000-ton vessel is named *Simferopol* and has made its trial trip. The vessel has a freezing capacity of 100 metric tons of fish or whale meat per 24 hours and is intended to transport fish or whale meat. (*Fiskets Gang*, September 16, 1960.)



## United Kingdom

## FISH MEAL PRODUCTION AND FOREIGN TRADE, 1955-59:

**Production:** From 1955 to 1959 the United Kingdom's domestic production of white fish meal remained fairly constant, while imports of white fish meal and herring meal increased considerably (see table 1). In 1959 the United Kingdom produced 78,300 long tons of fish meal, 73,700 tons (94 percent) of which was white fish meal and the balance, 4,600 tons, of herring meal.

The availability of domestically-caught herring for reduction in Great Britain has been decreasing in recent years,

## United Kingdom (Contd.):

Table 1 - United Kingdom's Production and Imports of Certain Fish Meals, 1955-59

Year	Domestic Production of White Fish Meal	Imports of White Fish and Herring Meal
	..... (1,000 Long Tons) . . .	
1959 . . . . .	74	147
1958 . . . . .	74	113
1957 . . . . .	75	109
1956 . . . . .	79	108
1955 . . . . .	77	91

and because of this the Herring Industry Board felt it could not commit itself to increased offerings of herring meal for sale during the first nine months of 1959 as compared with 1958. The Herring Industry Board was of the opinion that Peruvian meal, then offered for sale at 20 percent less, would not have any immediate harmful effect on the herring industry, as most buyers were already committed to purchases of domestic meal until March 1960.

**Imports:** Imports of Peruvian fish meal increased from 11,000 tons in 1958 to over 30,000 tons in 1959--the trend was still upward during the early months of 1960. There was also a substantial rise of imports from Norway and Denmark. Prices of domestic white fish meal in the United Kingdom held firm until the latter part of 1959, but from then on the increased imports began to have a marked effect on prices, to the detriment of the domestic fishing industry. Peruvian fish meal and oil gave the United Kingdom considerable competition in the European market.

\* \* \* \* \*

#### CRUDE WHALE AND HERRING OIL UTILIZATION INCREASED:

Utilization of crude whale and herring oil in Great Britain increased from 72,600 long tons during the first half of 1959 to 78,000 tons during the same period of 1960. (U. S. Foreign Agricultural Service Report, London, October 5, 1960.)

\* \* \* \* \*

#### EFFECT OF PRESERVATIVES ON FISH MEAL AND OIL QUALITY:

The studies by the British Torry Research Station on the preservation of whole fish and fish waste prior to processing into fish meal and oil were summarized in Food Investigation Technical Paper No. 6. The report has been re-issued and brought up to date by the inclusion of more recent work on the nutritional value of preserved material. The new publication appears as Torry Technical Paper No. 2, Preservation of Fish and Fish Offal for Oil and Meal Manufacture.

It is now clear that, although formaldehyde or nitrite may be used effectively in the stor-

age of whole fish, it would not be advisable to contemplate storage of minced material with these preservatives. Valuable flesh and tissue proteins react with these chemicals, and the lysine in the protein can be shown to be rendered partially unavailable by both chemical and biological methods of testing.

Storage of minced material would be ideal for production of meal and oil by azeotropic processes and this therefore is disappointing. Meals made from whole fish and large pieces of offal treated with preservatives are of high biological value as only the skin and surface proteins react with the chemicals.

The original paper stimulated exchange of information with other countries, and it has been possible to reproduce some of their data in the new report.

It is interesting to note the lengthy periods for which white fish offal can be stored under the climatic conditions in Newfoundland and the beneficial effects of preservation for even a few hours storage as in the United States menhaden industry.

Formaldehyde with chlortetracycline reduced the bacterial count in 48 hours by 250,000 times. The significance of this in connection with odors from reduction factories warrants consideration. (The Fishing News, September 16, 1960.)

\* \* \* \* \*

#### NEW FREEZE-DRYING PROCESS INCREASES SHELF LIFE OF FOODS:

A new food-preserving process, which reportedly increases the shelf life of foods to approximately two years, has been commercially developed by a British company and is being viewed with interest by several United States food companies, according to the Food Field Reporter of July 4, 1960. The process, known as Accelerated Freeze-Drying, will be used commercially for the first time anywhere by a British firm for a wide range of vegetables slated for export. Installation is expected by February 1961.

It is reported that this new process provides a logical advance in the prepacked food market and an alternative to deep-freeze methods of food preservation.

Technically, the process employs heating and drying of foods in a vacuum. The food is maintained at temperatures below freezing while it still has water content. In this way, the moisture in the frozen state converts to vapor without passing through the liquid phase. The effect is that all the natural flavor and color of the food is restored when the water is replaced. The process does not collapse the cells of the food. With the addition of water, the food regains its natural fresh appearance.

Besides cutting earlier standard freezing process time by one-third, food processed by Accelerated Freeze-Drying

### United Kingdom (Contd.):

weighs less than half the normal weight of food. As a result, transportation costs are drastically cut.

Foods processed by Accelerated Freeze-Drying have been subjected to various tests. Numerous tasting panels have judged the quality of the products to be equal to fresh foods and superior to foods preserved by other methods.

The British army has been conducting trials using freeze-dried foods to determine their applicability for use in the armed forces. Both the decrease in weight of the products and their compactness were cited as especially important factors.

Foods subject to freeze-drying could either be cooked in advance or processed raw. The only thing really required is to cut them sufficiently to enable the process to work on the food surface equally.

Originally, extensive research and development on the new process was carried out by the British Ministry of Agriculture, Fisheries and Food. The new system of dehydration was discovered accidentally about five years ago at the ministry's Aberdeen, Scotland, experimental factory.

An accident during experiments with a new vacuum-drying process actually brought about the discovery of freeze-drying. The food was first frozen and then placed between heated metal plates which turned the ice crystals into vapor without melting them. At this time, someone accidentally left open a valve in the machinery.

A severe vacuum was set up which froze the food solid and caused the dehydration process to be cut to one-sixth the ordinary time. As a result, the drying time was reduced from 48 to 8 hours.

\*\*\*\*\*

### NEW PLANT TO PRODUCE FROZEN-FISH DINNERS:

A new fish-processing factory at Grimsby, England, will soon be producing fish dinners, many of them for countries overseas. The factory has an area of 34,000 square feet, is equipped with the most modern machinery and handling equipment, much of it specially designed.

Its owners are among Britain's largest producers of quick-frozen foods, and export frozen fish, fruits, and vegetables to more than 40 different countries, among them the United States and Canada, Australia, Nigeria, Ghana, Southern Rhodesia, Kenya, Uganda, Nyasaland, Uruguay, British Honduras, the Bahamas, Siam, Ceylon, Fiji, Cyprus, Egypt, and Kuwait.

All conveyors and other equipment have been designed for easy cleaning and all conveyor belts are made of nontoxic materials.

The factory also has a cold-storage capacity of 300 tons, which operates at a temperature of -20° F.

A unique feature of the factory is a screw conveyor used to dispose of the fillet waste which is deposited into the conveyor.

A 20-inch screw conveyor passes under each filleting line below floor level, driving the offal forward into a 24-inch transverse screw conveyor carrying it across the factory floor and transferring it to an inclined screw conveyor. This takes the offal 85 feet to the top of a six-ton hopper from which it is discharged into waiting trailers.

There are 360 feet of conveyors and the type used has several advantages, among them the ability to force the offal towards the disposal point in a regular flow. The conveyors are completely enclosed for safety reasons and, while the offal cannot overflow, the system can easily be cleaned.

The conveyors are cleaned out thoroughly by steam at the end of each day's work. Adequate inspection plates are included on each conveyor to facilitate cleaning, but access to the screws cannot be gained while the conveyors are in motion.

All fish trunks and trays are thoroughly washed before use and another unusual feature of the factory is that the washing machine has been installed in the roof so that production space at floor level is used to maximum advantage.

The washing machine tank holds 1,500 gallons of water heated to a temperature of 200° F.

There are separate compartments for the cleaning of fish trunks and trays which are taken to and from their compartments by overhead conveyors. (*The South African Shipping News* and *Fishing Industry Review*, June 1960.)

\*\*\*\*\*

### REVIEW OF RESEARCH ON FISHERY BYPRODUCTS:

The United Kingdom is presently conducting extensive research directly concerned with fishery byproducts. Descriptions of work undertaken in the fields of the preservation of the raw material, the capacity of steam-jacketed fish-meal dryers, and concerning odors, follow:

## United Kingdom (Contd.):

**Preservation of Raw Material:** Re-infestation by blow-fly larvae of herring otherwise satisfactorily preserved with nitrite-formaldehyde, despite the initial kill, is a serious practical problem in summer. Spraying the surface of the mass of preserved fish with a 0.25 percent aqueous emulsion of pyrethrum has been found to be a promising alternative to the use of undesirably high levels of nitrite-formaldehyde. Further work is necessary to determine the frequency of pyrethrum spraying which may be necessary. It will depend on the duration of residual activity after spraying and on how long the surface of the mass of fish remains unbroken (e.g. by addition or withdrawal of fish).

Experiments with preservatives are being extended to material at present discarded at sea from fishing vessels. This would include viscera and unsalable species of fish. Facilities aboard existing vessels would be limited and two possibilities are envisaged: (a) dumping the material into a tank containing enough preservative solution to cover a full load, or (b) spraying a prescribed amount of a much stronger solution of preservative on to each standard measure (e.g. bucketful) of fish or viscera before tipping it into a tank. Preliminary experiments have shown both methods to be feasible, but the choice and amount of preservative require further consideration and experiment. Nitrite is more toxic than formaldehyde, looks innocuous, and has no odor. The objectionable odor of formaldehyde might afford a desirable safeguard against inadvertent contamination of food or drinking water on the trawler. Used alone, formaldehyde above a certain level causes so much toughening of fish that it does not break down adequately in the cook-and-press stage of the fish-meal plant. The amount of preservative should be varied according to the prevailing temperature. Thus, under British summer conditions, formaldehyde alone at 0.6 percent of the weight of the fish, applied as a spray, would be marginal for a 3-weeks' fishing trip, but would be excessive in winter.

Both formaldehyde and nitrite can react with the free amino group of the lysine component of the fish proteins. Lysine which has so reacted and is thus excluded from the chemically-determined "available" lysine has now been found to be unavailable to

chicks. Hence the chemical test is significant when applied to meals made from preserved fish. These findings further emphasize the desirability of preserving fish whole, or in large pieces, where only the surface layer will react with the preservative.

**Fish Meal Pilot Plant:** Studies are continuing concerning the factors that influence the capacity of steam-jacketed fish-meal dryers. Previous work showed that a straight-line relationship exists between capacity and the cube of the shaft speed, in the range 6-14 r.p.m. Although this simple relationship is not maintained at higher speeds, an increase of 50 percent in plant capacity can be achieved by increasing the shaft speed from the customary 10 to 30 r.p.m.

Experiments involving the introduction of heated air into the dryer have been postponed following difficulties due to bones choking a rotary air lock fitted to the meal outlet. However, capacity has been shown to increase when increased amounts of ventilating air are drawn through the dryer. The limit to this is just below the air velocity at which meal hold-up occurs. To obtain the fullest use of this ventilating air it is recommended that the exhaust vapor off-take duct should be as near as possible to the raw material inlet. This would necessitate the provision of some form of air seal at the inlet, e.g. a hopper of fish waste.

**Odors:** Pilot-scale tests at a commercial herring-meal factory with a venturi scrubber have been followed by experiments on a similar scale with a specially-built scrubber. One primary consideration was the necessity of ensuring only a low-pressure drop with a high gas-flow rate. At the same time the scrubber was designed to test combinations of water and chemical treatments, with a variety of packings, i.e. it was a flexible research tool. Although it has provided a mass of useful information, there are still many problems in the economical deodorization of the enormous volumes of gaseous effluent from pneumatic dryers.

Deodorization of a steam-heated or other type of indirect dryer is a potentially simpler problem. Pilot-scale experiments involving a completely closed cycle, with total recirculation of the scrubbed air, must await the fitting of a satisfactory air lock on the meal outlet. Tests with both water and chemical scrubbers are continuing. (Torry Research



## United Kingdom (Contd.):

Station, Annual Report 1959, Department of Scientific and Industrial Research.)

\* \* \* \* \*

### ULTRAVIOLET LIGHT USED FOR PURIFICATION OF OYSTERS:

Scientific use of ultraviolet light is playing a vital part in extensive plans to restore to Poole Harbour, Dorset, England, part of its lost importance in British fisheries. Two groups are trying to re-establish the harbor as one of the country's leading sources of oysters--a position it enjoyed in past centuries.

One of the keys on which success may possibly rest is an installation using germicidal lamps, a system which has been the subject of experiments by the British Ministry of Agriculture and Fisheries. It is also in use in Cornwall and Wales and is being considered by a firm in Colchester, a town renowned for its oysters.

The group consists of part-time oystermen. To meet Ministry of Health requirements concerning bacteriological levels in oysters, leaders of the group worked out details of an ultraviolet lighting purification system. The result has been the installation of a purification plant, built by the group, of three 30-watt germicidal tubes.

All the oysters gathered by the group of part-time oystermen and also by the second group (formed of local professional fishermen) are now being passed through the plant, the fishermen's group using it under an agreement.

The group of "amateurs" started their oyster project in 1953. In September 1958, they formed themselves into a company, with 42 shareholders, and now have more than 500,000 oysters laid in three beds, each of 30 acres, in the harbor.

Oysters gathered from the beds in the harbor are placed in one of two purification tanks--40 feet x 10 feet, and two feet deep--built by the group members at a small headquarters on the harbor foreshore. Then, over a period of 12 hours, the water in the tanks is circulated under the germicidal tubes.

The three-foot lamps are housed just above the water level in a 60-gallon tank, through which the sea water from the main purification tank is passed at the rate of 50 gallons per minute.

To ensure that the ultraviolet light focuses directly on all the water, this is passed at a wafer-thin depth, over a weir, which divides the 60-gallon tank into two sections. Then as the sea water is being returned in the main tank, it is passed through an aeration system.

An official of the amateur group says: "Our calculations show that we need leave the oysters in the main tank for only 12 hours. In that time, with the constant purification of the water, they pass out sufficient impurities to bring them well within the limits allowed by the Ministry of Health." (*The South African Shipping News and Fishing Industry Review*, June 1960.)

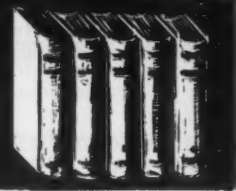
### IMPORTANCE OF CHILLING FISH

If fish is kept at an indoors summer temperature, say, 75° F., the number of bacteria will increase at a rapid rate, and the meat will be spoiled in a very short time indeed. Fortunately, however, the rate of multiplication of bacteria can be reduced by cooling. While it takes only half an hour for a young bacterium to grow and divide into two at summer temperatures, the process takes several hours at the temperature of melting ice (32° F.). At 77° F., 500 bacteria grow to the enormous number of several hundred millions in two days. At 32° F. (ice temperature) the same initial number of bacteria require 14 days to become several hundred millions. In practice spoilage begins to become obvious in fish like cod and haddock only after the numbers of bacteria have gone up to several million bacteria per sq. in. of skin surface.

For practical purposes the quickest, safest and easiest way to cool fish to about 32° F. and keep them at that temperature is to surround them and mix with them liberal amounts of crushed ice. Simply putting fish without ice into a chill room at 32° F. will cool them down very much more slowly even if the fish are laid out singly. Fish contained in wooden boxes put into a chill room without ice will cool down even more slowly since wood is a good heat insulator. Direct and intimate icing, therefore, because of its superior cooling action ensures that spoilage of the fish during the cooling down period is reduced to a minimum. Once fish has been cooled to 32° F. by icing, it can be kept at that temperature only by ensuring that sufficient ice envelops it to absorb heat coming in from its surroundings.



# FEDERAL ACTIONS



## Department of Health, Education, and Welfare

### FOOD AND DRUG ADMINISTRATION

#### COLOR ADDITIVES REGULATIONS ISSUED:

The Food and Drug Administration on October 12, 1960, issued the first of new regulations under the Color Additives Amendment to the Federal Food, Drug and Cosmetic Act. They became effective immediately upon publication in the Federal Register of October 12, 1960.

#### The regulations:

1. List the previously permitted coal tar colors which may continue to be used in foods, drugs and in cosmetics without any restriction on the amounts used until the necessary retesting is accomplished. The law allows  $2\frac{1}{2}$  years (from July 11, 1960) for the completion of any tests which may be necessary to establish safe limitations on the amounts of any of these colors which are found not completely "harmless." This may be further extended if scientific work completed in the  $2\frac{1}{2}$ -year period justifies it.

2. Terminate the listing for any use in foods, drugs or cosmetics of the colors External D & C Yellows Nos. 9 and 10. These colors under other designations (FD&C Yellows Nos. 3 & 4) had previously been delisted for all food, drug and cosmetic uses except external uses in drugs and cosmetics.

3. Terminate the listing for unrestricted use of 13 coal tar colors, largely lipstick colors, previously used without any limitation on the amount used. (Four other colors were automatically dropped from the listing because they had never been certified for use.)

4. Establish temporary tolerances for colors used in lipsticks, mouth washes, dentifrices and/or drugs for 11 of the 13 colors delisted for unrestricted use.

5. List color additives other than coal tar colors which were known to have been in use in foods, drugs and/or cosmetics prior to enactment of the law on July 13, 1960, and which may therefore continue in use for the  $2\frac{1}{2}$ -year grace period, or unless and until data are available on which to establish a tolerance or to revoke the provisional listing.

There may be other non-coal tar colors not listed which were in use prior to July 11. The Agency urged manufacturers of such colors to bring them to its attention promptly so that they may be added to the provisional list if it appears that they may be safely used



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### BUREAU OF COMMERCIAL FISHERIES

#### FROZEN OCEAN PERCH AND PACIFIC OCEAN PERCH FILLETS VOLUNTARY GRADE STANDARDS PROPOSED:

Frozen ocean perch fillets (Atlantic) and Pacific ocean perch fillets voluntary grade standards were proposed by the U. S. Bureau of Commercial Fisheries. The regulations are proposed for adoption in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended. Functions under that Act pertaining to fish, shellfish, and any products thereof were transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956.

The proposed standards, if recommended to the Secretary of the Interior for adoption and made effective, will be the first issued by the Department prescribing voluntary grade standards for frozen ocean perch fillets and Pacific ocean perch fillets.

Prior to the final adoption of the proposed regulations as published in the October 21, 1960, Federal Register, consideration will be given to written comments, suggestions, or objections relating thereto which are received by the Director, Bureau of Commercial Fisheries.

The proposed standards include product description, grades, recommended weights and dimensions, factors of quality and grade (including ascertaining the grade); definitions, lot certification tolerance, and score sheet.

The frozen ocean perch fillets under the standards are described as clean, whole, wholesome fillets cut away from either side of the Atlantic ocean perch (*Sebastes marinus*) or the Pacific ocean perch (*Sebastes alutus*) which are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product.

\* \* \* \* \*

#### NEW ALASKA

##### REGIONAL DIRECTOR NAMED:

The appointment of Harry L. Rietze as Regional Director for the Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, in Alaska, was announced October 12, 1960, by Assistant Secretary of the Interior Ross Leffler. Rietze replaces John T. Gharrett, who earlier this year was transferred to Gloucester, Mass., as Regional Director of the Bureau's North Atlantic Region. Rietze joined the Bureau in Alaska in 1958. Prior to that time he was employed with the Oregon State Fish Commission and was in charge of Columbia River Investigations. In 1958, Rietze was appointed Assistant Regional Director for the Bureau of Commercial Fisheries' Alaska Region and he served in that capacity since that time.



#### Supreme Court

##### GULF STATES REQUEST RECONSIDERATION OF DECISION ON OFFSHORE BOUNDARIES:

The United States Supreme Court on September 26, 1960, was asked to reconsider its decision limiting the offshore boundaries of Louisiana, Mississippi, and Alabama to 3½ miles from their shores into the Gulf of Mex-

ico, in a brief submitted by the Attorneys General of 12 states. The brief referred to the Court's May 31, 1960, decision which also ruled that Texas and Florida were entitled to submerged lands and resources extending for 10½ miles into the Gulf.

The brief said that the Submerged Lands Act of 1953 which the Court interpreted in its May 31 decision was not "justified by the history of the region" or the constitutional history of the Nation.

The 12 Attorneys General represented Arkansas, Colorado, Florida, Georgia, Indiana, New Mexico, Oklahoma, North Carolina, South Carolina, Tennessee, Utah, and Virginia. The brief was submitted in support of one filed earlier by Alabama, Louisiana, and Mississippi.



#### Eighty-Sixth Congress

##### (Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



**FISH AND WILDLIFE LEGISLATION** (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-sixth Congress, Second Session, on H.R. 7386 and S. 2053, bills to provide for the acceptance by the United States of a fish hatchery in the State of South Carolina; H.R. 5959, H.R. 6115, H.R. 6104, H.R. 11298, and S. 1262, bills to direct the Secretary of the Interior to establish a research program in order to determine means of improving the conservation of game fish in dam reservoirs; H.R. 8613 and S. 2481, bills to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes; H.R. 2777 and H.R. 3348 to amend the Fisheries Cooperative Marketing Act; and H.R. 9917 and S. 2867, to give effect to the convention between the United States of America and Cuba for the conservation of shrimp, signed at Habana, August 15, 1958, March 22, 23, June 7 and 30, 1960), 120 pp., printed. Contains text and purpose of each bill mentioned; and statements, letters, and testimony by various Congressmen; government and industry officials; and fish canning associations.

**MERCHANT MARINE LEGISLATION** (Hearings before the Subcommittee on Merchant Marine of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-sixth Congress, Second Session, on S. 2185, a bill to provide appropriate public recognition of the gallant action of the steamship Mer-edith Victory in the December 1950 evacuation of Hungnam, Korea; H.R. 3900, a bill to permit the use of foreign-built hydrofoil vessels in the coastwise trade of the Commonwealth of Puerto Rico; H.R. 9599, a bill to provide transportation on Canadian vessels between ports in southeastern Alaska, and between Hyder, Alaska, and other points in southeastern Alaska, and between Hyder, Alaska, and other points in the United States outside Alaska, either directly or via a

foreign port, or for any part of the transportation; H.R. 7102, a bill to amend the Merchant Marine Act, 1936, for the purpose of providing with respect to the requirements for the operation of subsidy constructed vessels that certain vessels shall be considered as operating in foreign trade; H.R. 10470, to authorize the Maritime Administration to make advances on government-insured ship mortgages; H.R. 11199, to further amend the shipping laws to prohibit operation in the coastwise trade of a rebuilt vessel unless the entire rebuilding is effected within the United States, and for other purposes, February 3, March 1, June 10, 17, 21, and 22, 1960), 194 pp., printed. Contains text and purpose of each bill; and statements, letters, and testimony of various Congressmen, government officials, and union and industry representatives.



#### A FIBERGLAS RAFT FOR GROWING OYSTERS OFF THE BOTTOM

During studies on the growth of oysters off the bottom, a Fiberglas raft was designed and built to support the weight of 25 bushels of marketable oysters. This raft is a rectangular box with horizontal wings on each long side. The box is  $12\frac{1}{2}$  feet long, 16 inches wide, and 8 inches high. The wings are  $12\frac{1}{2}$  feet long, 10 inches wide, and  $\frac{1}{2}$  inch thick. Each wing has two rows of holes ( $\frac{5}{16}$  inch in diameter, 4 inches apart). Nylon and plastic strings with experimental oysters attached are hung from these holes. A hole 1 inch in diameter is drilled at each end for the attachment of a mooring line. Total cost of the raft was \$225.

The raft weighs about 70 pounds and can easily be carried by two men. It is so designed that either the top or the bottom can rest in the water. Annually the raft is turned over and all fouling organisms are scraped off.

The Fiberglas raft has been moored in 10 feet of water at Taylors Pond, South Chatham, Mass., since August 18, 1958. During this time it has been subjected to strong winds and winter icing without any damaging effects to the structure. To date, use of the craft has proved successful as a method of growing oysters off the bottom. (*The Progressive Fish-Culturist*, October 1960.)

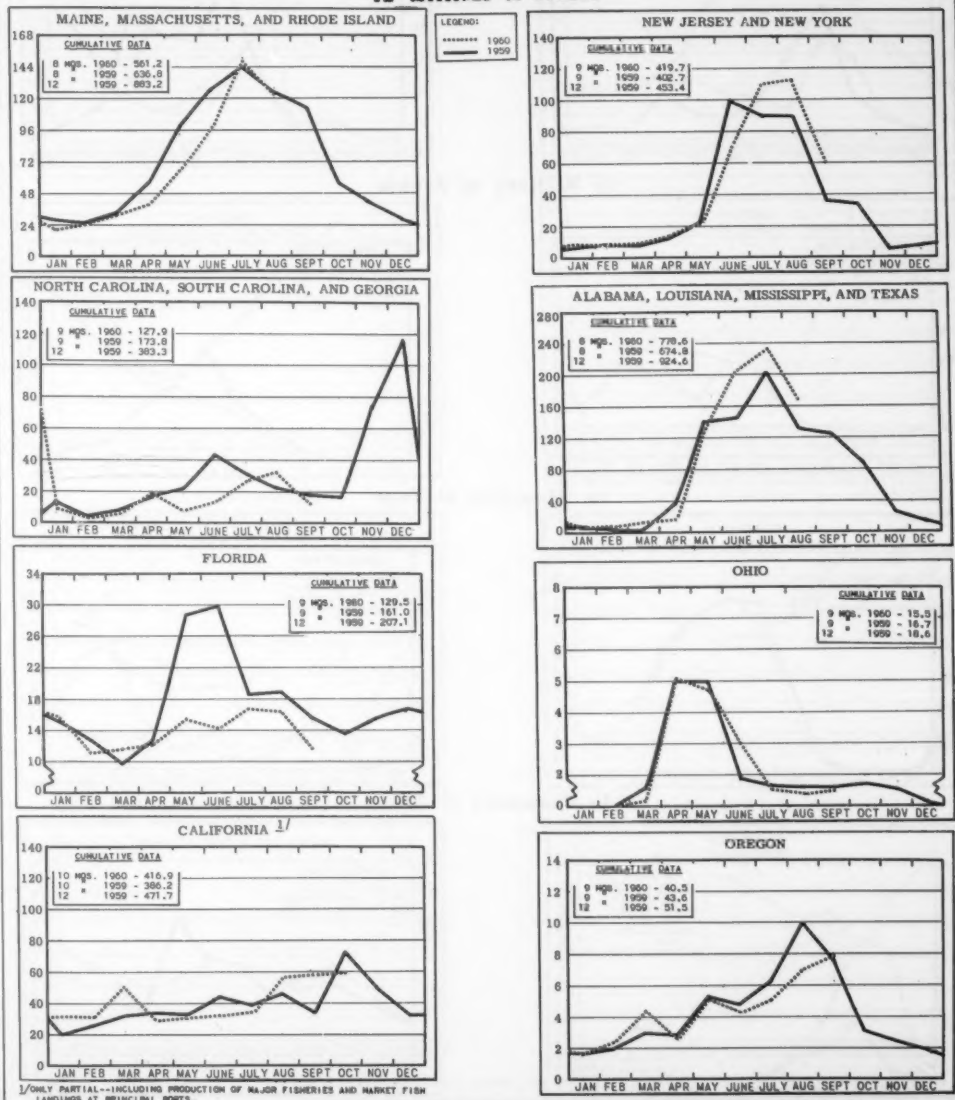




# FISHERY INDICATORS

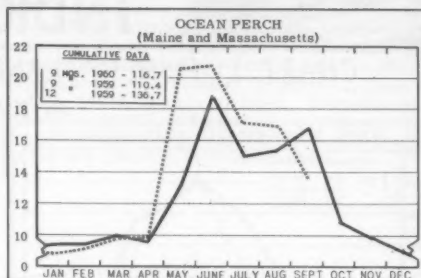
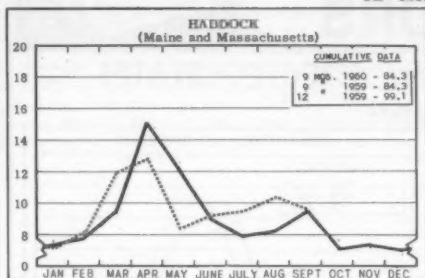
## CHART I - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

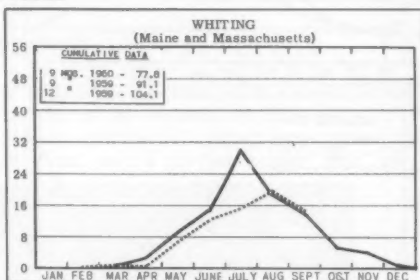
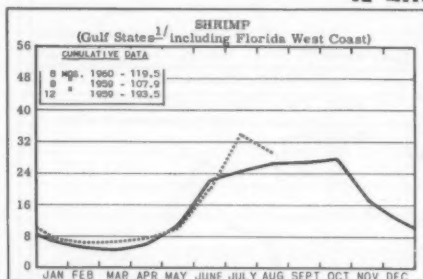


## CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

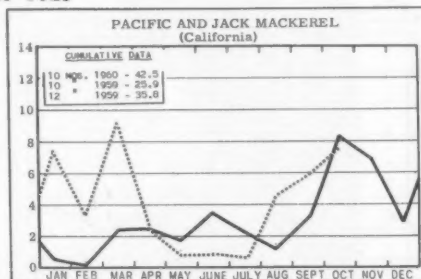
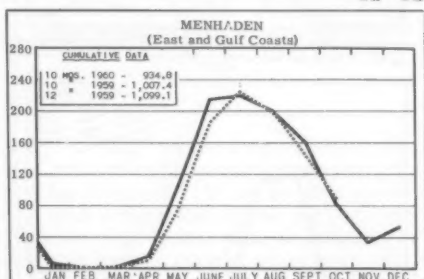


In Millions of Pounds

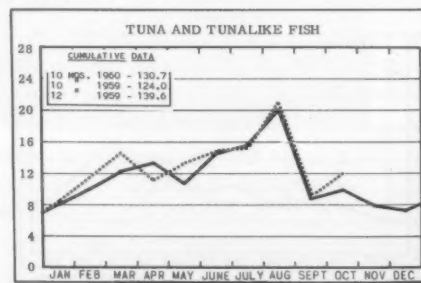
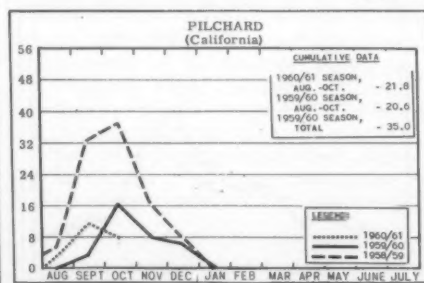


<sup>1/2</sup>LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons

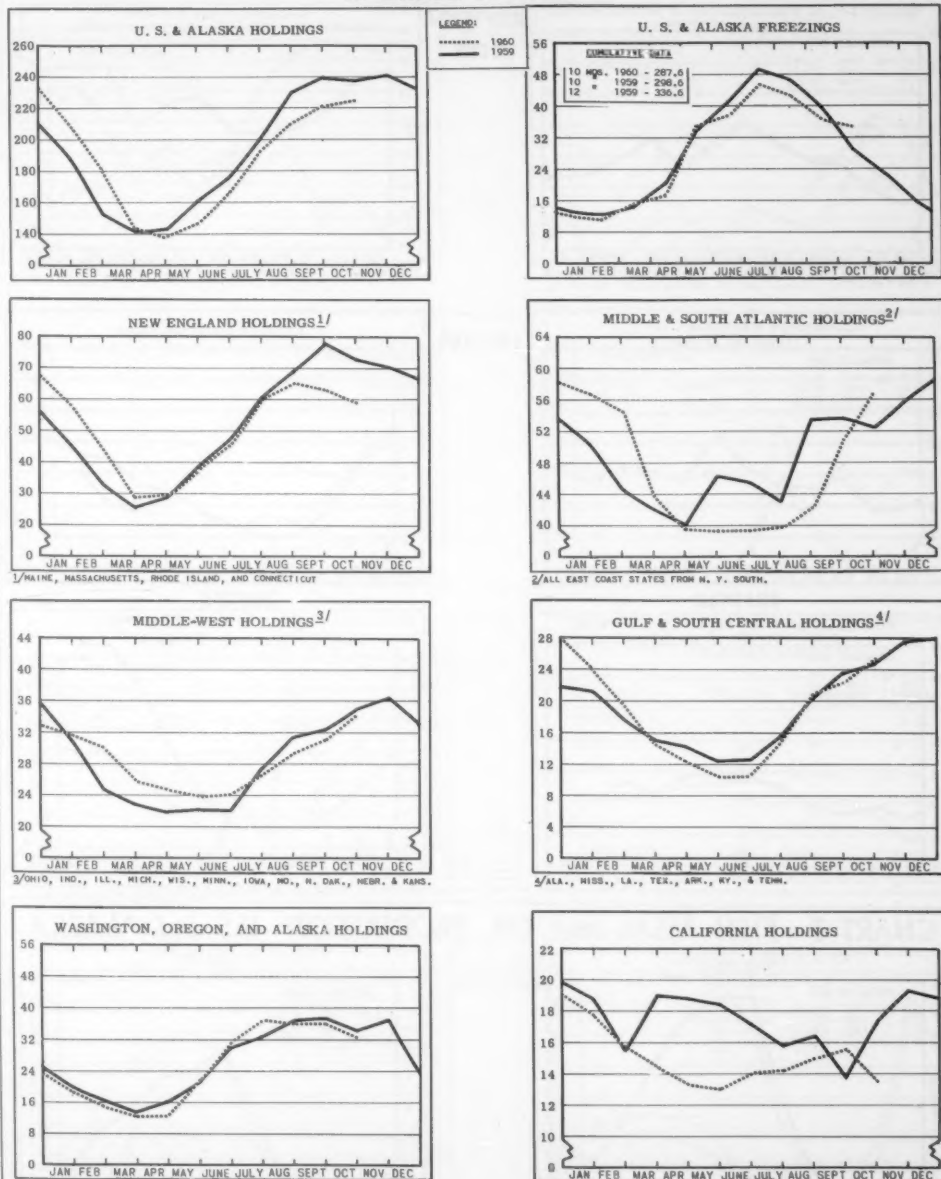


In Thousands of Tons



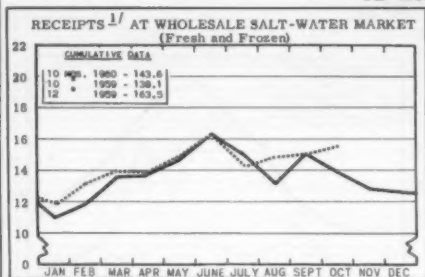
# CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS \*

In Millions of Pounds



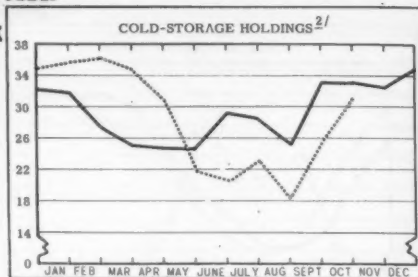
\* Excludes salted, cured, and smoked products.

# **CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS** In Millions of Pounds

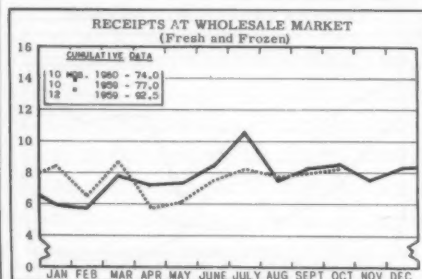


<sup>1/</sup>INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

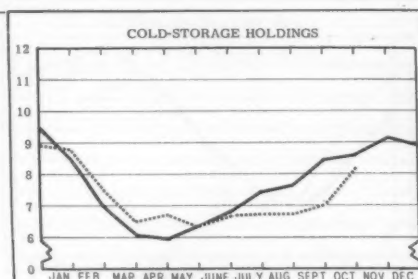
**NEW YORK CITY**



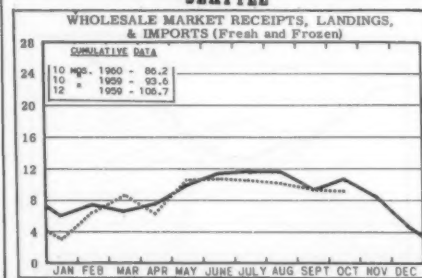
<sup>2/</sup>AS REPORTED BY PLANTS IN METROPOLITAN AREA.



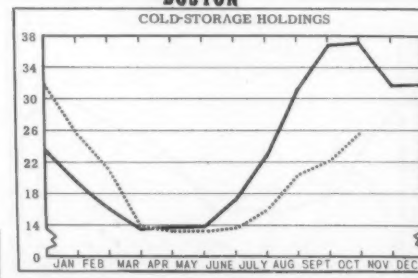
**CHICAGO**



**SEATTLE**



**BOSTON**

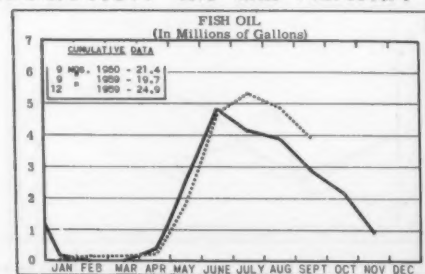
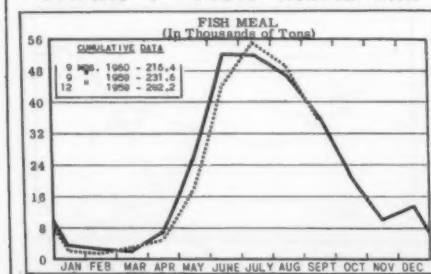


LEGEND:

..... 1960

———— 1959

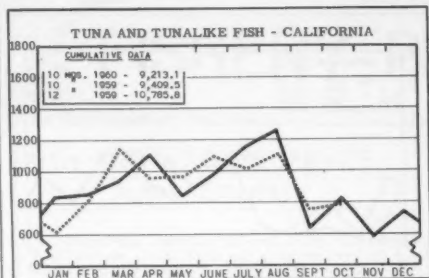
## **CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA**





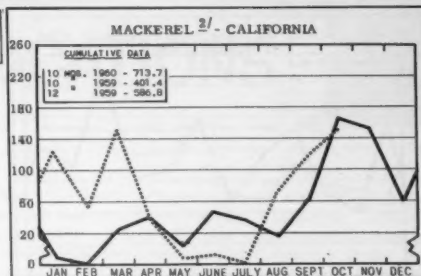
# CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases

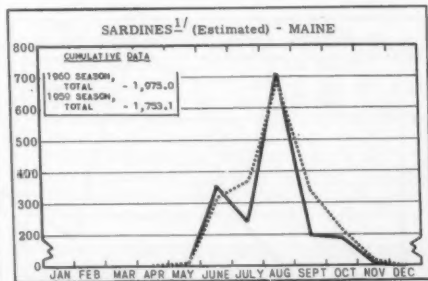
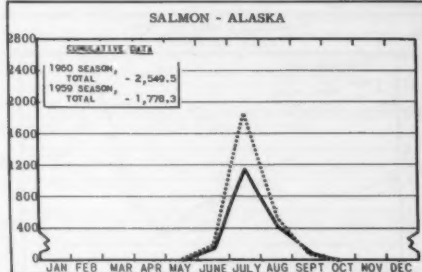
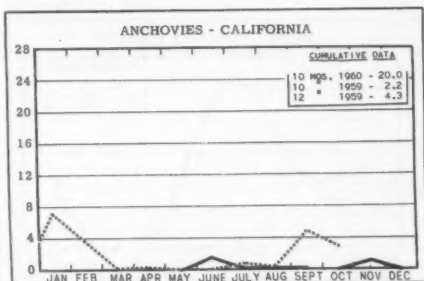


LEGEND:

..... 1960  
—— 1959



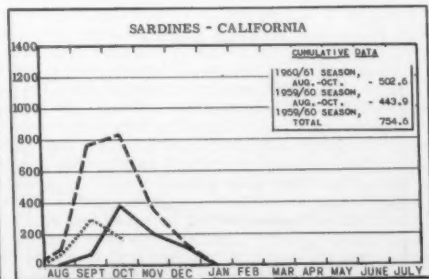
<sup>2/</sup> INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



<sup>1/</sup> INCLUDING SEA HERRING.

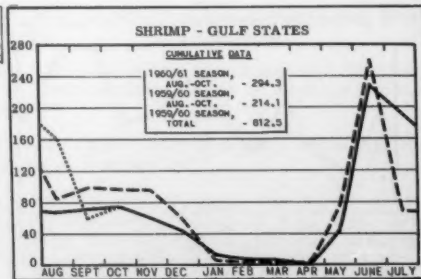
## STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



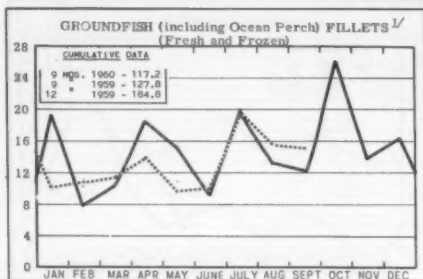
LEGEND:

..... 1960/61  
—— 1959/60  
- - - 1958/59

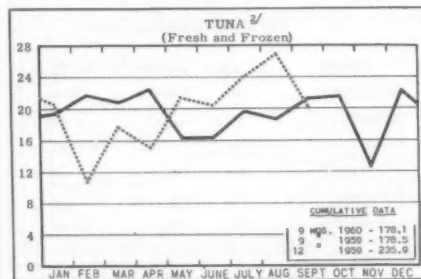
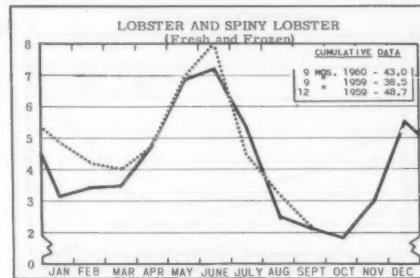
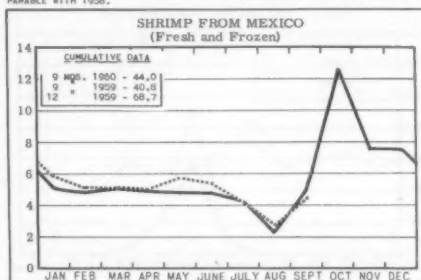
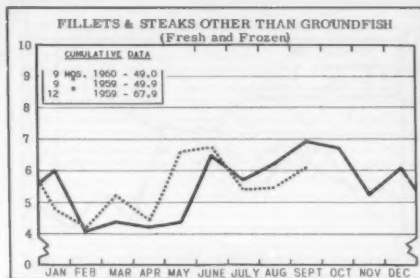


# CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

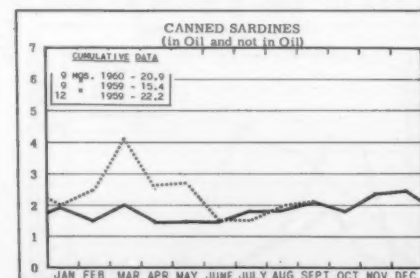
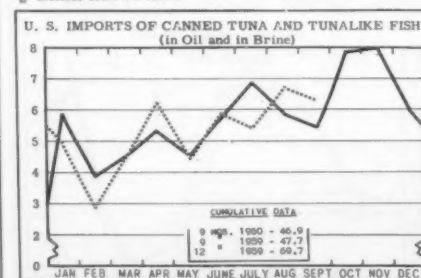
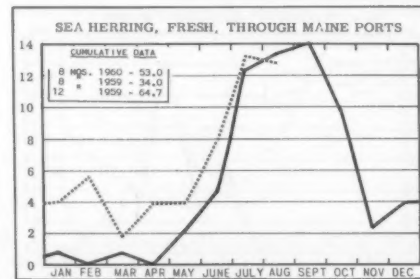
In Millions of Pounds

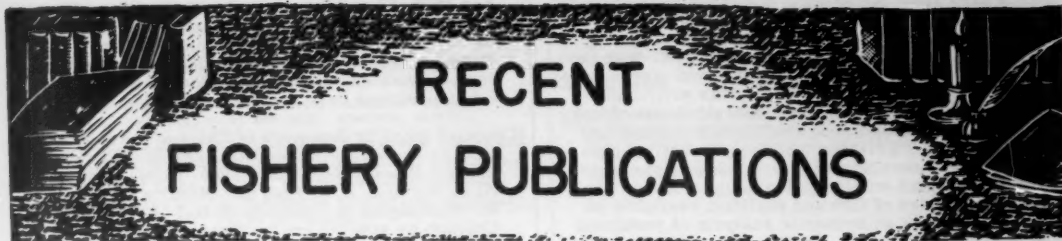


<sup>1/</sup>SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1960.



<sup>2/</sup> EXCLUDES LOINS AND DISCS.





## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE  
DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASH-  
INGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
SL - BRANCH OF STATISTICS LIST OF DEALERS IN AND PRODUCERS  
OF FISHERY PRODUCTS AND BYPRODUCTS.  
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS-FISHERIES (LIMITED  
DISTRIBUTION).  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number   | Title   |
|----------|---|
| CFS-2388 | - Fish Meal and Oil, July 1960, 2 pp.   |
| CFS-2388 | (Supplement) - U. S. Fish Meal and Scrap<br>Production, 1929-1959 (HS No. 2), 4 pp. |
| CFS-2390 | - Frozen Fish Report, August 1960, 8 pp.  |
| CFS-2393 | - New York Landings, July 1960, 4 pp.   |
| CFS-2394 | - Alabama Landings, May 1960, 2 pp.   |
| CFS-2395 | - Alabama Landings, June 1960, 2 pp.  |
| CFS-2396 | - Ohio Landings, July 1960, 2 pp.   |
| CFS-2397 | - Louisiana Landings, February and March<br>1960, 3 pp.                             |
| CFS-2399 | - Shrimp Landings, July 1960, 6 pp.   |
| CFS-2400 | - North Carolina Landings, August 1960, 3 pp.                                       |
| CFS-2401 | - Texas Landings, July 1960, 3 pp.  |
| CFS-2402 | - Maine Landings, July 1960, 3 pp.  |
| CFS-2403 | - Maryland Landings, August 1960, 3 pp.   |
| CFS-2404 | - New Jersey Landings, July 1960, 3 pp.   |
| CFS-2405 | - Florida Landings, August 1960, 7 pp.  |
| CFS-2407 | - Georgia Landings, August 1960, 2 pp.  |
| CFS-2408 | - South Carolina Landings, August 1960, 2 pp.                                       |
| CFS-2409 | - Mississippi Landings, June 1960, 2 pp.  |
| CFS-2410 | - Texas Landings August 1960, 3 pp.   |

FL-432 (Revised) - Fishery Statistical Publications of  
the Bureau of Commercial Fisheries, by E. A. Power  
and Francis Riley, 31 pp., illus., processed. Con-  
tains a descriptive listing of all current fishery  
statistical publications released by the U. S. Fish  
and Wildlife Service. Also contains listings of fish-  
ery statistical reports released by other Federal  
agencies, International Commissions, Interstate  
Compact Commissions, and non-Government fishery  
agencies. The leaflet catalogs in detail publications  
in the Current Fishery Statistical series; daily,  
monthly, and annual Fishery Market News Service  
reports; Commercial Fisheries Review; and statis-  
tical digests. These contain data relating to the  
volume and value of the catch by area and species;  
the volume and value of processed products; freez-  
ings and cold-storage holdings; foreign-trade data;  
compilations of landings and distribution and market-  
ing conditions; prices; current data on foreign fish-  
eries; and other pertinent data.

FL-449 (Revised) - Organizations and Officials Con-  
cerned with the Commercial Fisheries, 1960, 17 pp.,  
April 1960. Lists officials and organizations con-  
cerned with the commercial fisheries in the United  
States Government, interstate compact commissions,  
international and related commissions, foreign  
embassies and consulates with fisheries represen-  
tation, and industry and related organizations in-  
terested in the fisheries. Also lists selected in-  
stitutions offering courses in fisheries and related  
sciences, and congressional committees.

FL-492 - Sea Turtles of the United States, by David K.  
Caldwell, 20 pp., illus., March 1960.

FL-496 - The True Pikes, by John Van Oosten, 9 pp.,  
illus., April 1960.

Wholesale Dealers in Fishery Products, 1959 (Revised):  
SL- 8 - Pennsylvania.

SL-25 - Wisconsin (Great Lakes Area).

SL-34 - Wisconsin (Mississippi River and Tributaries).

SSR-Fish. No. 322 - Temperatures of Lake Michigan,  
1930-32, by John Van Oosten, 36 pp., illus., March  
1960.

SSR-Fish. No. 330 - A Photoelectric Current Meter, by  
H. C. Boyar and F. E. Schueler, 9 pp., illus., March  
1960.

SSR-Fish. No. 334 - Limnological Survey of Eastern  
and Central Lake Erie, 1928-1929, 202 pp., illus.,  
June 1960.

SSR-Fish. No. 345 - Physical, Chemical, and Biological  
Observations in the Eastern Tropical Pacific Ocean  
Scot Expedition, April-June 1958, by Robert W.  
Holmes and Maurice Blackburn, 109 pp., 1960.

Sep. No. 602 - A Review of the Atlantic Coast Whiting  
Fishery.

Sep. No. 603 - Rapid Objective Freshness Test for Blue-  
Crab Meat and Observations on Spoilage Character-  
istics.

Sep. No. 604 - Equipment Note No. 5 - Sink Gill-Net  
Fishing in New England.

Fishery Bulletin of the Fish and Wildlife Service, vol.  
54, 1952 and 1954, Bulletins 75 to 88, 7 pp., printed.  
Title page, table of contents, and index to be used for  
binding a set of bulletins issued during 1953 and 1954.

Fishery Bulletin of the Fish and Wildlife Service, vol.  
56, 1954-56, Bulletins 90 to 106, 7 pp., printed.

Title page, table of contents, and index to be used for binding a set of bulletins issued during 1954-56.

Fish and the Fishing Industry, by Andrew W. Anderson, 18 pp., illus., printed. (Reprinted from Agricultural Year Book, 1960, pp. 353-370.) This article discusses the chemical and nutritional attributes of fish and shellfish; adoption of standards and voluntary inspection by the fishing industry; statistical data available; Market News Service publications; market development and technological services of the Bureau; species of fish and shellfish available on the market; and an economic analysis of problems of the fishing industry. It also covers the Fish and Wildlife Act of 1956 and the Saltonstall-Kennedy Act; biological research work of the Bureau; work of the Division of Resource Management; and exploratory fishing investigations.

Who Buys Canned Tuna, and Why? Circular 88, 66 pp., illus., June 1960.

Who Buys Canned Salmon, and Why? Circular 89, 52 pp., illus., June 1960.

Who Buys Canned Sardines, and Why? Circular 90, 73 pp., illus., June 1960. This and the other two reports describe the results of surveys of the motivational factors which influence the buying habits of household consumers of canned tuna, canned salmon, and canned sardines. The prime objective of the studies is to aid the domestic canned fish industries to expand markets for their products. Results and findings of the studies are especially directed toward the improvement of promotional and merchandising techniques. However, they have also a direct bearing on other important aspects of canned fish marketing such as the adaptation of the product to meet specific consumer preferences.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-33	- Marine Habitat Improvement in Japan.
MNL-34	- Greek Fisheries, 1959.
MNL-35	- Reduction Plants in Newfoundland.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Alaska Fur Seal Investigations, Pribilof Islands, Alaska (Report of Field Activities, June-September 1959), by Carl E. Abegglen, Alton Y. Roppel, and Ford Wilke, 139 pp., illus., processed, limited distribution. U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Marine Mammal Research, Seattle, Wash.

(Baltimore) Monthly Summary - Fishery Products, May 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, August and Septem-

ber 1960, 13 and 7 pp., respectively, illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Topographic chart; sea-surface temperature charts, Eastern Pacific Ocean; and other pertinent data; for the months indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, September 1960, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, September 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, August 1960, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for August 1960; September 1960, 18 and 19 pp., respectively. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the months indicated.

Pelagic Fur Seal Investigations, California, Oregon, and Washington, 1959, by Karl Niggol, Clifford H. Fiscus, Jr., and Ford Wilke, 100 pp., illus., processed, limited distribution. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Marine Mammal Research, Seattle, Wash.)

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, September 1960, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; receipts and vessel prices of troll salmon; also



Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE OFFICE INDICATED:

U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

On the Difference of the Stomach Contents of Tuna and Black Marlin in the South Equatorial Pacific Ocean, by Sigeyuki Koga, 11 pp., processed. (Translated from Bulletin of the Faculty of Fisheries, Nagasaki University, no. 7, 1958, pp. 31-40.)

On the Stomach Contents of Tuna in the West Indian Ocean, by Sigeyuki Koga, 11 pp., processed. (Translated from Bulletin of the Faculty of Fisheries, Nagasaki University, no. 6, 1958, pp. 85-92.)

BIOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, SEATTLE, WASHINGTON.

Soviet Russian Discontent and the Japanese Fishery Today, by Yoshinosuke Yamazaki, 1 p., processed. (Translated from Suisan Keizai Shimbun, no 2419, March 19, 1959.)

Third Japan-Soviet Fishery Conference - Protect the Salmon Resources from Predation - The Catch Phrase of the Japanese Representatives, 16 pp., processed, March 1959. (Translated from The Fishing Industry Weekly, no. 232, January 15, 1959.)

BUREAU OF COMMERCIAL FISHERIES, TECHNOLOGICAL LABORATORY, SEATTLE, WASHINGTON.

Carbonyl Compounds in Fish as Related to Deterioration. I--Detection of Volatile Carbonyl Compounds Formed in Fish Flesh, by F. Ota, 9 pp., illus., processed. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 5, 1958, pp. 334-337.)

Lipids of the Muscle of Tuna, THUNNUS ORIENTALIS. I--Acetone-Soluble Lipids of the Ordinary Muscle; II--Acetone-Soluble Lipids of the Dark-Colored Muscle, by Hisanao Igarashi, 8 pp., processed. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, no. 12, 1957, pp. 787-794.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Japanese Summer Fishery for Albacore (GERMOAL-ALUNGA), by Wilvan G. Van Campen, Research Report 52, 31 pp., illus., printed, 1960, 15 cents. The important albacore fishery carried on by a fleet of Japanese live-bait tuna boats in the spring and early summer in the northwestern Pacific is described. An account is given of the historical background of the fishery, and the magnitude of its production is compared with other Japanese albacore fisheries and with the United States west coast tuna fishery. The seasonal trends in landings, geographical distribution of bases and fishing grounds, and the marketing and utilization of the catch are discussed. The fishery is shown to be the largest in the world for this species, although a recent outgrowth of, and still subsidiary to, the Japanese skipjack fishery, and to be largely dependent on foreign markets for its support.

"A Portable Conductivity Meter for Use with Electro-fishing Gear," by Richard B. Thompson and Richard H. Van Haagen, article, Progressive Fish-Culturist, vol. 22, April 1960, p. 63, processed, single copy 25 cents.

Relation Between Fish Condition and Population Size in the Sardine (SARDINOPS CAERULEA), by John S. MacGregor, Fishery Bulletin 166 (from Fishery Bulletin of the Fish and Wildlife Service vol. 60), pp. 215-230, illus., printed, 20 cents, 1959.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS TO BE FOLLOWED SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OF PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### AGAR AGAR:

"Studies on the Chemical Constitution of Agar-Agar. XXI--Re-Investigation of Methylated Agarose of Gelidium amansii," by Choji Araki and Susumu Hirase, article, Bulletin of the Chemical Society of Japan, vol. 33, March 1960, pp. 291-295, printed. Chemical Society of Japan, No. 5, 1-Chome, Surugadai Kanda Chiyoda-ku, Tokyo, Japan.

### ALGAE:

"New Delhi Symposium on Algae," by G. E. Fogg, article, Nature, vol. 185, March 19, 1960, pp. 820-821, printed. Nature, MacMillan & Co., Ltd., St. Martin's St., London WC 2, England.

### ANTIBIOTICS:

"The Application of Chlortetracycline in Extending the Storage Life of Chilled Fish Fillets," by F. Babin and T. Sakharova, article, Kholodil'naja Tekhnika, no. 4, 1960, pp. 35-37, illus., printed in Russian with short summary in English. Kholodil'naja Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

"Effectiveness of Tetracycline Treatment on Quality Improvement of Processed Foods. II--Quality Improvement and Chlortetracycline Residue of Salt Salmon Due to CTC-Treatment," by Tetuo Tomiyama and Yasuo Yone, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 1, 1959, pp. 67-71, illus., printed in Japanese with English abstract. Bulletin of the Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

"Penetration of Tetracycline Antibiotics into Tuna, Sole, and Rockfish Flesh and Their Stability during Steaming and Retorting," by Peter A. Lerke and Lionel Farber, article, Food Technology, vol. 14, May 1960, pp. 217-221, printed. Food Technology, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

### AUSTRALIA:

Third Annual Report on the Operation of the Fishing Industry Act 1956 During the Year Ended 30th June 1959, 5 pp., processed. Department of Primary

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Industry, Canberra, Australia. This report outlines the operations of the Fisheries Development Trust Account, established for the purpose of financing activities designed to foster the development of the Australian fishing industry, for the year ended June 30, 1959. It discusses the shrimp trawling survey; exploratory trawling in the Great Australian Bight; and investigations of the barracuda and spiny lobster industries.

#### BIOCHEMISTRY:

"The Amino Acid Composition of Some Fish Collagens: The Relation Between Composition and Structure," by Karl A. Piez and Jerome Gross, article, *Journal of Biological Chemistry*, no. 235, April 1960, pp. 995-998, printed. The American Society of Biological Chemists, Inc., Mt. Royal and Guilford Aves., Baltimore, Md.

"Determination of Actomyosin in Fish Muscles," by L. I. Pershina, article, *Izvestia Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya*, no. 5, 1958, pp. 157-161, printed in Russian. Izdanie Krasnodarskogo Instituta Pishchevoi Promyshlennosti, ul. Krasnaya, 135, Krasnodar, U. S. S. R.

#### BIOLOGY:

*The Biology of Marine Animals*, by J. A. Colin Nicol, 718 pp., printed, 95s. (about US\$13.30). Sir Isaac Pitman and Sons, Ltd., London, England, 1960.

#### BRAZIL:

*Lista dos SCIAENIDAE Marinhos Brasileiros, Contendo Chave de Identificacao e Proposta de "Nomes Vulgares Oficiais,"* (List of the Brazilian Marine Sciaenidae, Containing a Key for Identification and a List of Proposed "Official Common Names"), by Haroldo Travassos and Melquiades Pinto Paiva, 31 pp., illus., printed in Portuguese. (Reprinted from *Boletim do Instituto Oceanografico*, vol. 8, nos. 1 and 2, 1957, pp. 139-165.) Boletim do Instituto Oceanografico, Universidade de Sao Paulo, Sao Paulo, Brazil.

#### CALIFORNIA:

*California Cooperative Oceanic Fisheries Investigations Reports* (January 1, 1958, to June 30, 1959), vol. 7, 217 pp., illus., printed. California Dept. of Fish and Game, Marine Research Committee, Sacramento, Calif., January 1960. This report consists of two sections. The first section contains a review of the present operational organization of the investigations, a brief review of the research under way during the period reported on, a description of the partial resurgence of the sardine fishery during the 1958/59 season, and a list of publications arising from the program. The second section is a report on a symposium held in June 1958 to review the unusual changes in the ocean circulation off California during 1957 and 1958. The cooperating agencies are: California Academy of Sciences; California Department of Fish and Game; Stanford University, Hopkins Marine Station; U. S. Bureau of Commercial Fisheries; University of California, Scripps Institution of Oceanography.

#### CANADA:

*Fisheries Statistics of Canada, 1958* (Ontario, Prairie Provinces, and Northwest Territories), 67 pp., printed in French and English, C\$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1960. Contains tables giving the value of the princi-

pal species of inland fish landed, 1951-58; quantity and value of landings by species and fisheries districts, 1957-58; capital equipment used in the primary fisheries operations; and the number of persons engaged in the fisheries. This information is presented separately for the provinces of Ontario, Manitoba, Saskatchewan, Alberta, and the Northwest Territories.

*Fisheries Statistics of Canada, 1958* (Prince Edward Island), 20 pp., printed, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1960. Contains tables showing the quantity and value of fishery products landed in Prince Edward Island, 1939-1958, by species; quantity and value by species and fisheries districts; quantity and value of manufactured fishery products by species, 1957-1958; capital equipment in the primary fisheries operations; and the number of fishermen engaged in the primary fisheries operations.

*Fisheries Statistics of Canada, 1958* (Quebec), 61 pp., illus., printed in French and English, C\$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1960. Consists of statistical tables giving the quantity and value of the principal species of fish and shellfish landed in Quebec in 1939-58; quantity and value of landings by species and fisheries districts, 1957-58; capital equipment employed in the primary operations by fisheries districts, 1957-58; and number of persons engaged in primary operations by fisheries districts, 1957-58.

*Journal of the Fisheries Research Board of Canada*, vol. 17, no. 4, July 1960, 149 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others these articles: "The Effect of Impoundment on the Population and Movement of Atlantic Salmon in Ellerslie Brook, Prince Edward Island," by J. W. Saunders; Assessment of the Progressive Spoilage of Ice-Stored Shrimp," by J. R. Iyengar and others; "Facilities for Anadromous Fish Passage, Passamaquoddy Project," by M. C. Bell and C. H. Clay; "Possible Effects of Passamaquoddy Tidal Power Structures on the Canadian Lobster Industry," by D. G. Wilder; and "The Role of Electrical Conductivity of Water in Shocking Lampreys (*Petromyzon marinus*)," by R. W. McCauley.

*Report of the Royal Commission on Price Spreads of Food Products*, vol. III, 570 pp., illus., processed, C\$2. Queen's Printer and Controller of Stationery, Ottawa, Canada, March 1960. Consists of research documents, statistical data, and extended studies of the marketing of particular commodities, including fishery products. The section on fisheries prices includes an introduction to studies of fisheries commodities, and information on canned sockeye salmon; Pacific halibut; lobsters; cod and haddock fillets; and whitefish fillets and dressed whitefish. Contains a number of statistical tables showing the Fisheries Prices Support Board operations, 1948/49 to 1957/58; British Columbia canned salmon pack by species and by years, 1949 to 1958; freight rates on canned fish and boxed fish from British Columbia to eastern Canadian destinations; landings of Pacific halibut, 1949-58; annual Canadian landings and landed values of lobsters, by Provinces, 1949 to 1958; and other pertinent data.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### CARIBBEAN COMMISSION:

Report of the Third Caribbean Fisheries Seminar (St. Maarten, Netherlands Antilles, July 3-9, 1959), 45 pp., processed. Central Secretariat, Caribbean Commission, Kent House, Trinidad, W. L., 1959. Covers the agenda and reports presented at the Third Caribbean Fisheries Seminar attended by delegates and observers from Governments in the Caribbean area. Specific problems related to the fishery industry included fisheries statistics, marketing and economics of the fishery industry, fishing boat design including engine selection, improvement of fishing gear, fish farming, and regional training. The Seminar considered a proposal for the setting up of some regional association of fisheries officers for the Caribbean.

#### COD:

"Animal Physiology Water Content of Cod (*Gadus callarias* L.) Muscle," by R. M. Love, article, Nature, vol. 185, March 5, 1960, p. 692, printed. Nature, Mac Millan & Co., Ltd., St. Martin's St., London WC 2, England.

"Free and Combined Amino Acids in the Flesh and Liver of Baltic Cod," by Teofil Dabrowski and Zenon Ganowiak, article, Roczniki Panstwowego Zakladu Higieny, vol. 9, 1958, pp. 549-556, printed in Polish with English summary. Panstwowy Zaklad Wydawnictw Lekarskich, ul. Chocimska, 22, Warsaw, Poland.

"The Identity of the Larval Nematodes Found in the Body Muscles of the Cod (*Gadus callarias* L.)," by J. N. R. Grainger, article, Parasitology, vol. 49, May 1959, pp. 121-131, printed. Parasitology, Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

#### COMMISSIONS:

Twelfth Annual Report of the Pacific Marine Fisheries Commission for the Year 1959, 40 pp., printed. Pacific Marine Fisheries Commission, 741 State Office Bldg., 1400 S. W. Fifth Ave., Portland 1, Oreg. Reports briefly the specific activities of the Pacific Marine Fisheries Commission during 1959 and presents a review of long-term developments in the fields of research, regulation, and coordination. Recommends the admission to membership on the Commission of the States of Alaska and Hawaii and any other state having streams tributary to waters draining into the Pacific Ocean. Presents sections on commercial and sport salmon fisheries, the otter-trawl fishery, the Pacific Coast crab industry, and the shrimp and albacore fisheries.

#### CORAL REEFS:

"Our First Underseas Park," by Gilbert L. Voss, article, National Parks Magazine, vol. 34, no. 157, October 1960, pp. 12-14, illus., printed. National Parks Association, 1300 New Hampshire Ave., NW., Washington 6, D. C. The Key Largo Coral Reef Preserve, laying entirely under water, was established by presidential proclamation on March 15, 1960. This preservation, about 75 square miles in area, is situated south of Miami and east of the northern Florida Keys. It encompasses both lagoon and barrier reefs and contains two lighthouses. The reefs give shelter to scores of species of fish, including sponges, turtles, grouper, snapper, spiny lobster, and conch. The idea of establishing the park origi-

nated with conservationists interested in preservation of the area from commercial and other depredations, and was realized with the aid of the State of Florida and the U. S. Department of the Interior.

#### CUBA:

Ictiologia Cubana (Cuban Ichthyology), by Don Felipe Poey y Aloy, vol. 1, 373 pp., illus., printed in Spanish. Ministerio de Educacion, Republica de Cuba, Havana, Cuba, 1955.

#### EUROPEAN COMMON MARKET:

"Common Market Speeds Ahead," article, Foreign Commerce Weekly, vol. 64, no. 11, September 12, 1960, pp. 5-6, printed, single copy 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

#### EUROPEAN FREE TRADE ASSOCIATION:

"Completely Free Trade for Members EFTA's Goal by 1970," article, Foreign Commerce Weekly, vol. 64, no. 11, September 12, 1960, pp. 9, 24, printed, single copy 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

#### FAROE ISLANDS:

Development of the Faroese Fishing Fleet, Faroes in Figures no. 11, September 1960, 6 pp., printed. Faroes in Figures, Faero Amts Sparekasse, Copenhagen, Denmark. Summarizes the renewal and enlargement of the Faroese fishing fleet to date and the purchase and intended purchase of new vessels. Discusses Government and private financing for the building of new vessels and the rebuilding of old ones and the present composition of the fleet. Includes several statistical tables showing types of vessels utilized, operation of the Faroese Fishing Vessel Mortgage Finance Corporation, and production and export of salted fish and dried cod.

#### FISH CULTURE:

Fish Culture, for Fun, for Profit, by Wayne Seaman and Gene Cook, Educational Pamphlet No. 6, 16 pp., illus., printed. Education Division, Colorado Game and Fish Department, 1530 Sherman St., Denver 1, Colo., revised April 1960. A handbook for those interested in fish culture for sport, food, or economic gain in the Rocky Mountain area. Discusses the basic requirements for fish culture--proper water supplies and suitable construction; trout culture; and warm water fish--water and food, pond and fish, and pond management. A list of reference books on fish culture is included.

Methods of Treating the Bottoms of Fish Ponds and Their Effects on Productivity--Part I; and Fish Culture in Certain European Countries--Part II, by Alfred G. Wurtz, General Fisheries Council for the Mediterranean Studies and Reviews No. 11, 50 pp., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, June 1960. Part I, which contains a brief summary of the various methods of treating the bottoms of fish ponds and their effects on productivity, discusses the treatment of the ground at the bottom of

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

the ponds, with or without crop growing. The author states that "the drying out of the bottom of fish ponds is indispensable in order to obtain high fish production." Part II gives an account of fish-pond cultural practices and piscicultural research in certain European countries.

#### FISH FLOUR:

"Biological Quality of Dilis Fish Flour Used as Source of Protein for Growing Rats," by Angelina Alcaraz-Bayan and Ruth M. Leverton, article, Philippine Journal of Science, no. 86, 1957, pp. 259-271, printed. Institute of Science, Manila, Philippines.

#### FISH MEAL:

"Acceptability of Fish Meal to Young Turkey Poults," by B. A. Krautman and C. D. Caskey, article, Feedstuffs, vol. 32, March 26, 1960, pp. 74-75, printed. Feedstuffs, Miller Publishing Co., 118 So. 6th St., Minneapolis 2, Minn.

"Quality of Protein in Different Kinds of Fish Powder (Meal)," by A. Vinokurova, article, Shornik Studii Nauchno-Issledovatel'skii Rabot Moskova Sel'skokhoz. Akademii im. Timiryazeva, no. 8, 1958, pp. 331-336, printed in Russian. Nauchno-Issledovatel'skii Rabot Moskova Sel'skokhoz. Akademii im. Timiryazeva, Moscow, U. S. S. R.

"Relation of Residual Oil and Menhaden Fish Meal Quality," by Thomas L. Meade and Russell T. McIntyre, article, Proceedings of the Gulf and Caribbean Fisheries Institute, vol. 10, 1958, pp. 86-91, printed. The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

#### FISH OIL:

"Preparation of a Coating Material by Chlorination of Fish Oil. V--Aeration Velocity of Chlorine," by Kosaku Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, July 1959, pp. 218-221, illus., printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

#### FLORIDA:

Ichthyological Surveys of the Lower St. Lucie and Indian Rivers, Florida East Coast, by Victor G. Springer, 19 pp., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., June 23, 1960.

Summary of Florida Commercial Marine Landings, 1959 and an Analysis of the Catch and Effort of Certain Species, by Albert Rosen, no. 60-2, 54 pp., illus., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., June 1960. Presents a summary of Florida's commercial landings of marine products for 1959. The fisheries for shrimp, mullet, Spanish mackerel, menhaden, and other species are covered. For the second consecutive year, data for individual fishing trips were collected from a sample of fish dealers. Includes a number of statistical tables giving data on landings and value of catches by species and by counties during 1959.

#### FOOD AND AGRICULTURE ORGANIZATION:

Current Bibliography for Aquatic Sciences and Fisheries, vol. 3, Parts 1 and 2, 192 pp. and 120 pp., respectively, printed, each part 17s. 6d. (US\$2.60),

plus postage, or subscription per volume of 12 parts £9 (US\$27) post free. Fisheries Biology Branch, Food and Agriculture Organization of the United Nations, Rome, Italy, 1960. (Available from Subscription Dept., Taylor & Francis, Ltd., Red Lion Court, Fleet St., London EC4, England.) Lists documents (including films and filmstrips) referring to studies of living aquatic resources and their environments, or to methods of research applicable in that field. References on fishing craft, gear and methods, and on primary fishery industries generally are included where their contents seem relevant to appraisal and use of resources. In addition, references to fisheries legislation concerning secondary and tertiary, as well as primary fishery industries, and relating to economic and technological as well as biological fields, are included.

The Economic Importance of the Sea Fisheries in Different Countries, FAO Fisheries Papers No. 15, 14 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, August 1959. The text of a paper presented at the United Nations Conference on the Law of the Sea, held in Geneva, Switzerland, from February to April 1958. The most general statistical indicator of the importance of sea fisheries in the economy of a country is the proportion of the national income derived from them. This report includes statistical tables showing the product of the sea fisheries as percentage of aggregate domestic product and other indicators of the economic importance of the sea fisheries in selected countries; indicators of the economic importance of the sea fisheries in different countries; and disposition of the catch by countries, 1955.

Mediterranean Brackish Water Lagoons and Their Exploitation, by Ruggero de Angelis, GFCM Studies and Reviews No. 12, 66 pp., illus., processed. General Fisheries Council for the Mediterranean Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, August 1960. This is the third and final study in a series on brackish-water fisheries. In the first section of this study, the author discusses the principles of exploitation: history and operation of the "valli," a barricade for trapping lagoonward migrating pelagic fish; characteristics of the lagoons; and gear used in landing the fish found in lagoons. In the second section, he covers the Mediterranean lagoons. Physical characteristics of the various lakes and lagoons are discussed together with the gear used and species of fish found in each locality.

The Need for Economic Statistics of the Fisheries, by Anthony Scott, FAO Fisheries Papers No. 16, 12 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, March 1960. The text of a paper presented at the Expert Meeting on Fishery Statistics in the North Atlantic Area, held in Edinburgh, Scotland, in September 1959. Discusses the need for measuring the costs of fishing, examples of cost statistics, relation between output and cost, the use of cost and value estimates, and fishing in relation to connected industries.



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Purpose and Methods in Fisheries Statistics, Doc. No. 13--"Development of Fishery Statistics in the Management of Philippine Fisheries," by Bayani Ong-changco, 13 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, March 1952.

\_\_\_\_\_, Doc. No. 16--"The Statistical Work of the International Council for the Exploration of the Sea in Retrospect," by Nils Rosen, 6 pp., April 1952.

\_\_\_\_\_, Doc. No. 23--"The Collection of Pelagic Fish Statistics," by B. B. Parrish, 4 pp., May 1952.

\_\_\_\_\_, Doc. No. 29--"Swedish Fisheries Statistics - Existing Organization and Planned Improvements," by Otto Zetterberg, 5 pp., July 1952.

Some Economic Aspects of Fish Pond Operations, by Wylie D. Goodsell, FAO Fisheries Papers No. 14, 49 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, February 1959. A brief report of a tour of inland fisheries in ten important European, Mid-Eastern and Far-Eastern countries. The object of the tour was to study the economic aspects of fish-pond culture, especially the practices and methods of production, financing, and distribution, and their bearing on costs of operation and income of owners. The tour was connected with and a part of the Third International Inland Fisheries Training Centre held at Bogor, Indonesia, from October 31 to December 10, 1955. The report is divided into sections on pond culture and on general observations on the pond fisheries in the countries visited.

TILAPIA MOSSAMBICA (Peters), Preliminary Findings in Netherlands New Guinea, by G. A. Reeskamp Jr., IPFC Occasional Paper 60/1, 3 pp., processed. Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Road, Bangkok, Thailand.

The Use of Fishery Statistics by Government and Business in North America, by John B. Rutherford, FAO Fisheries Papers No. 18, 14 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, July 1960. The text of a paper presented at the Expert Meeting on Fishery Statistics in the North Atlantic Area, which was held in Edinburgh, Scotland, in September 1959. Discusses the position of business and role of governments; classification of uses of fishery statistics; the "action," "immediate," or "short-term" use in marketing by both business and government, in current fisheries management, and in current economic indicators; and the "planning," "research," or "long-term" use in research by business, in biological and economic research by governments and universities, in analyzing and describing industry structure, in general economic investigations, and by governments and international fisheries management.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These re-

ports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

#### Report to the Government of:

Iraq on the Development of Inland Fisheries, by A. van den Eelaart, FAO Report No. 270, April 1954.

Chile on Increasing Fish Consumption, by John Fridthjof, FAO Report No. 271, April 1954.

Ceylon on the Mechanization of Fishing Operations, by Alan Glanville, FAO Report No. 284, July 1954.

Liberia on the Handling, Processing, and Marketing of Fish, by Jan van Pel, FAO Report No. 286, July 1954.

Italy as the Administering Authority for the Trust Territory of Somalia on the Exploratory Fishery Survey in Somalia, 1952/53, by H. W. Ogilvie, A. Fraser-Brunner, and D. L. Byrd, FAO Report No. 288, August 1954.

#### FRANCE:

"La Peche et le Marche des Crustaces au Cours des Cinq Dernieres Annees" (The Fishery and the Market for Crustaceans during the Last Five Years), by L. Plouas, article, La Peche Maritime, vol. 39, no. 989, August 1960, pp. 453-457, printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

"Le Rapport sur la Production du Comite Central des Peches Maritimes--La Production Francaise en 1959: 476,000 Tonnes pour Plus de 62 Millions d'Anciens Francs" (The Production Report by the Central Committee on Maritime Fisheries--French Production in 1959: 476,000 Metric Tons Valued at more than 62 Billion Old Francs), article, La Peche Maritime, vol. 39, no. 989, August 1960, pp. 463-469, printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

#### FREEZER TRAWLERS:

"Recent Developments in Propulsion Machinery and Freezing Equipment for Deep-Sea Trawlers," by G. C. Eddie, article, Shipbuilder and Marine Engine Builder, May 1958, pp. 3-8, printed. Shipbuilder and Marine Engine Builder, Newcastle-on-Tyne, London, England.

#### FREEZERS:

"New Vertical-Plate Freezer Steps Up Performance," by Arthur V. Gemmill, article, Food Engineering, vol. 32, April 1960, pp. 66-68, printed. Food Engineering, McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y.

#### FRENCH ANTILLES:

"La Peche aux Antilles et en Guyane Francaise" (The Fishery in the Antilles and French Guiana), by Jean Morice, article, pour l'Expansion Economique des Departements d'Outre-Mer, no. 1, July 1960, pp. 19-22, illus., printed in French. Societe d'Assistance Technique et de Credit Social d'Outre-Mer, 235, Boulevard Saint-Germain, Paris (VII<sup>e</sup>), France.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### FRENCH POLYNESIA:

"The Utilization of Marine Resources in French Polynesia," by Michel Angot, article, South Pacific Bulletin, vol. 10, no. 3, July 1960, pp. 46-50, illus., printed, South Pacific Commission, Box 5254, G. P. O., Sydney, Australia. Reviews fishery and other marine resources of the Windward Islands, Leeward Islands, the Tuamotu Group, and the Marquesas, and discusses methods and problems of exploiting them. Covers the type of vessel used, method of fishing, and species landed in the lagoons, on reefs, outside the reefs but within sight of land, and in the deep-sea fisheries. Describes the marketing systems within and outside the Society Islands and mother-of-pearl shell--the one marine export product.

#### FROZEN STORAGE:

"Odor Transference from Fish to Butter and Fried Chicken During Frozen Storage," by Ernest A. Fieger and Arthur F. Novak, article, Quick Frozen Foods, vol. 23, no. 1, August 1960, pp. 94-96, printed. Quick Frozen Foods, E. W. Williams Publishing, Inc., 82 Wall St., New York 5, N. Y. A study was conducted over a three-year period to determine if odors from fish would be transferred to fried chicken and butter during frozen storage. Results showed that proper packaging can prevent transfer of odors from one food to another.

#### GREAT LAKES:

"Canada's Great Lakes Research Program," by D. V. Anderson, article, The Conservationist, August-September 1960, pp. 2-5, 34, illus., printed. The Conservationist, Rm. 335, State Campus, Albany, N. Y. The author reports on a long-range, comprehensive study of Canada's Great Lakes. The program received a great boost in 1958 with the loan from the Royal Canadian Navy of the Porte Dauphine, a 125-foot, 400-ton vessel, easily adapted to research work. From April 1959 to March 1960, this vessel covered 17,000 miles, concentrating on Lake Ontario but cruising in the other lakes as well. Valuable hydrographic, biological, and meteorological data were collected. The vessel was sponsored by the University of Toronto and cooperatively supported by Federal and provincial agencies.

#### HALIBUT:

"Variations in Chemical Composition of Different Parts of Halibut Flesh," by Claude E. Thurston and Patricia P. MacMaster, article, Food Research, vol. 25, March-April 1960, pp. 229-236, printed. Food Research, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

#### IRRADIATION PRESERVATION:

Food Irradiation Quarterly International Newsletter, vol. 1, no. 1, July-September 1960, 39 pp., processed. O.E.E.C. Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., N. W., Washington 6, D. C. The first issue of a new quarterly published by the European Information Center for Food Irradiation. Contains, among others, an article entitled: "U. S. Government Increases Activity in Radiation Processing of Foods," by Eugene W. Scott. Also discusses the inauguration of the European information center for food irradiation; study of O.E.E.C. for a European Food Irradiation Center; and threshold for induced radioactivity in irradiated foods. The publication also contains reports on meetings, scholarship and study opportunities, and a selected bibliography.

arship and study opportunities, and a selected bibliography.

"Tooling Up for Low Dose Irradiation Processing of Fresh Foods," by Warren W. Eukel and Wolfgang Huber, article, Food Technology, vol. 14, April 1960, pp. 198-203, printed. Food Technology, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

#### LABOR LEGISLATION:

Supplement to Federal Labor Laws and Agencies (1960 Supplement to Bulletin 123), 75 pp., printed, 30 cents. Bureau of Labor Standards, U. S. Department of Labor, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This booklet will serve as a guide to the layman on matters pertaining to labor-management relations, social security, employment security, and working conditions. It discusses in detail the Labor-Management Relations Act (Taft-Hartley Act); Labor-Management Reporting and Disclosure Act of 1959; Welfare and Pension Plans Disclosure Act; Social Security Act; Railroad Retirement Act; unemployment insurance legislation; Safety Amendment to Section 41 of the Longshoremen's and Harbor Workers' Compensation Act; and other labor legislation.

#### LAKE TROUT:

Further Observations on the Survival of Yearling Lake Trout Planted in South Bay, Lake Huron, by J. C. Budd and F. E. J. Fry, 7 pp., illus., printed. (Reprinted from The Canadian Fish Culturist, no. 26, March 1960, pp. 7-13.) The Queen's Printer and Controller of Stationery, Ottawa, Canada.

Survival and Growth of Tagged Lake Trout in South Bay, Lake Huron, by John C. Budd, 2 pp., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 89, no. 3, 1960, pp. 308-309.) The American Fisheries Society, Librarian, Colorado A. and M. College, Fort Collins, Colo.

#### MADAGASCAR:

Bulletin de Madagascar, vol. 10, no. 171, August 1960, 80 pp., illus., printed in French. Service General de l'Information, Place Colbert, Tananarive, Madagascar. Includes, among others, an article on the inland fisheries entitled, "Monographie du Lac de Tampolo-Fenerive" (Monograph on the Lake of Tampolo-Fenerive), by A. Kiener. With the granting of self-governing status to this former French colony, Madagascar is now known as the Malagasy Republic.

#### MARINE BORERS:

Marine Borer Investigations, Final Report 60-1, May 1960, 37 pp., illus., processed. The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

#### MARKING FISH:

The Use of Lead Versenate to Place a Time Mark on Fish Scales, by F. E. J. Fry and others, 5 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 89, no. 2, 1960, pp. 149-153.) The American Fisheries Society, Librarian, Colorado A. and M. College, Fort Collins, Colo.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### MELANESIA:

"SPC Fisheries Investigations in Melanesia," by H. van Pel, article, *South Pacific Bulletin*, vol. 10, no. 3, July 1960, pp. 25-28, illus., printed. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia.

#### MIDWATER TRAWLING:

*Midwater Trawling Studies in the North Pacific*, by William Aron, 10 pp., illus., printed. (Reprinted from *Limnology and Oceanography*, vol. 4, no. 4, October 1959, pp. 409-418.) Woods Hole Oceanographic Institution, Woods Hole, Mass. Summarizes the results of midwater trawling studies conducted in the North Pacific by the research vessel *Brown Bear* of the University of Washington, Department of Oceanography, during the summer of 1957. The trawl studies were made on a cruise devoted primarily to research for the International Geophysical Year program. The trawling studies were primarily exploratory--to find out what animals inhabit the depths under study and also to obtain some idea of their relative abundance. Within these two major objectives, information was desired regarding the horizontal and vertical distribution of trawl-caught animals and the relationship between these distributions and the oceanographic data which were obtained during the course of the work.

#### NETHERLANDS:

*Jaarcijfers over de Visserij Gedurende het Jaar 1959* (Annual Fisheries Statistics, 1959), No. 51, 163 pp., illus., printed in Dutch with English titles and summaries, and statistical tables in both Dutch and English. Directie van de Visserijen, 's-Gravenhage, Netherlands, 1960. A review of Dutch fisheries during 1959 covering the sea, inshore, and river and inland fisheries; Government regulations; whaling; export of salted and smoked herring; fisheries research; and fishing vessels. The second half of the report is devoted to statistical tables showing number and tonnage of fishing vessels of various types; quantity and value of fish and shellfish landed at each port by Dutch and foreign vessels; extent and outcome of the drift-net, trawl, and Danish seine fisheries; landings in the various coastal and inland fisheries; whaling results; outcome of the salmon and other pelagic fisheries; and other pertinent data.

#### NORWAY:

"Fiskernes Inntektsniva i 1958" (Investigation of Fishermen's Income in 1958), article, *Fiskets Gang*, vol. 46, no. 28, July 14, 1960, pp. 417-422, printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

#### NYASALAND:

*Annual Report of the Department of Game, Fish and Tsetse Control for the Year Ended 31st December 1959*, 32 pp., printed. The Government Printer, Zomba, Nyasaland, 1960. The section of fisheries discusses the state of the fish stocks, the non-African fishery, the African fishery, the fish trade, developmental and experimental work, fisheries research organizations, trout fishing, and fish farming. Also includes tables showing results of experimental work done with various types of floats, different colors of nets, and other similar data.

#### ORGANIZATION FOR EUROPEAN ECONOMIC COOPERATION:

*Fishery Policies in Western Europe and North America*, 302 pp., illus., printed \$3. OEEC Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., NW., Washington 6, D. C. September 1960. A report describing the fishery policies of the 18 Western European member countries of the Organization for European Economic Cooperation. The members are Austria, Belgium, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and the United Kingdom. The United States and Canada participated in the work as associate members. Yugoslavia is represented by an observer but since July 1959 has participated on an equal basis with member countries in work on agriculture and food. The report covers: conditions in the fisheries of each country--size of fleet and vessels, production, utilization, consumption, imports, and exports; and policies pursued in an effort to improve the condition of the fisheries--duties, quotas, price stabilization schemes, subsidies, low-interest loans, grants, landing bans, and other government programs. The member countries operate fisheries which in 1958 accounted for one-third of the world's total fish production. The increase in the fish production of OEEC countries since the end of World War II has been achieved by the introduction of bigger and more efficient vessels and by improved fishing techniques. While catches per man have risen considerably, catches per ton of fishing vessel have shown a decline. A wide range of fishery policies is employed in the various countries. Measures ranging from general services to schemes for direct financial support have encouraged an expansion of production and a high degree of self-sufficiency in fish supplies in most countries. OEEC countries could, however, by coordinating their fishery policies, make substantial progress in improving the economic position of their fisheries.

"Les Travaux de l'O.E.C.E. sur les Pêcheries Européennes" (The Work of the O.E.C.E. on European Fisheries), by R. Lagrade, article, *La Pêche Maritime*, vol. 39, no. 989, August 1960, pp. 459-460, printed in French. La Pêche Maritime, 190 Boulevard Haussmann, Paris, France.

#### OYSTER DRILLS:

"Copper, a Possible Barrier to Oyster Drills," by John B. Glude, article, *Proceedings of the National Shellfisheries Association*, vol. 47, 1958, pp. 73-82, printed. National Shellfisheries Association, U. S. Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.

#### OYSTERS:

"Microbiology of Shellfish. Bacteriological Study of the Natural Flora of Pacific Oysters (*Crassostrea gigas*)," by R. R. Colwell and J. Liston, article, *Applied Microbiology*, vol. 8, March 1960, pp. 104-109, printed. Applied Microbiology, Williams and Wilkins, Mt. Royal and Guilford Aves., Baltimore 2, Md.

*Oyster Mortality Studies by the Chesapeake Biological Laboratory* (Preliminary Progress Report), by G. Francis Beaven, L. Eugene Cronin, and Elgin A. Dunnington, Ref. No. 60-25, 6 pp., processed. Mary-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

land Dept. of Research and Education, Chesapeake Biological Laboratory, Solomons, Md., June 30, 1960.

"Studies on Freshness Determination of Fish Meal by the Distillation Ratio of Volatile Acids. IX--On the Applicability of D. R. Value to the Determination of the Freshness of Oyster," by Suez Asakawa, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, no. 9, 1959, pp. 714-718, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

#### PERU:

*La Industria Peruana de Pesca en 1959* (The Peruvian Fishery Industry in 1959), by Javier Iparraguirre Cortez, Serie de Divulgacion Cientifica No. 13, 21 pp., processed in Spanish. Ministerio de Agricultura, Direccion de Pesqueria y Caza, Lima, Peru. The annual report on the Peruvian fisheries for 1959 by the Department of Fisheries and Wildlife. Covers the position of Peru in the world fisheries; fish landings by species; utilization of the catch; freezing and canning of fishery products; and manufacture of fish meal and fish oil. Includes a number of statistical tables showing the quantity and value of fishery products consumed in the greater Lima area; landings of fish and their utilization; foreign trade in fishery products; world production of canned fish and fish meal; and landings of whales.

#### PESTICIDES:

*Some Effects of Pesticides on Marine Arthropods and Mollusks*, by Victor L. Loosanoff, 5 pp., processed. (Reprinted from the Transactions of the Second Seminar on Biological Problems in Water Pollution, April 20-24, 1959.) Public Health Service, U. S. Department of Health, Education, and Welfare, Washington 25, D. C.

#### PORTUGAL:

*Boletim da Pesca*, vol. 13, no. 68, September 1960, 100 pp., illus., printed in Portuguese. Gabinete de Estudos das Pescas, R. S. Bento, 644, 4<sup>a</sup>-Esq., Lisbon, Portugal. Contains these articles: "Documentos sobre Higiene de Farinhas de Peixe em Angola" (Papers on Sanitation of Angolan Fish Meal), by E. Tropa and J. Brito Guterres; "Deficiencias e Potencialidade Economica do Camarao, em Lourenco Marques" (Deficiencies and Economic Potentiality of the Shrimp of Lourenco Marques), by Luis Marques Neto; "Algumas Consideracoes sobre os Elementos de Base para a Exploracao Nacional das Pescas" (Some Considerations on the Basic Elements for a National Fisheries Exploration Program), by F. Marques da Silva; "Teoria e Pratica sobre a Industria da Pesca" (Theory and Practice in the Fishery Industry), by Pompilio da Cruz; and "Os Pescadores de S. Tome" (The Fishermen of S. Tome), by Jose Marques Elpidio.

#### QUALITY:

"Correlation of Taste Panel Gratings with Salt-Extractable Protein of Frozen Fish Fillets," by M. N. Moorjani, W. A. Montgomery, and G. G. Coote, article, *Food Research*, vol. 25, March-April 1960, pp. 263-269, printed. Food Research, The Garrard Press, 510 N. Hickory St., Champaign, Ill.

"A New Method for Estimating the Freshness of Fish," by Tsuneyuki Saito, Arai Ken-ichi, and Minoru Mat-

suoshi, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, no. 9, 1959, pp. 749-750, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

#### RED TIDE:

"The Effect of Salinity on Growth of *Gymnodinium breve* Davis," by David V. Aldrich and William B. Wilson, article, *The Biological Bulletin*, vol. 119, no. 1, August 1960, pp. 57-64, illus., printed. The Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass.

#### SEA HORSE:

*The Sea-Horse and Its Relatives*, by Gilbert Whitley and Joyce Allan, 90 pp., illus., printed. Georgian House Pty. Ltd., 296 Beaconsfield Parade, Middle Park, Melbourne S. C. 6, Australia.

#### SEAWEEDS:

*Sobre a Prospeccao Algologica com Fins Industriais Efectuada no Arquipelago de Cabo Verde* (Availability of Agar-Bearing Seaweeds in the Cape Verde Islands), by F. Palminha, Notas Mimeografadas do Centro de Biologia Piscatoria 11, 8 pp., processed. Centro de Biologia Piscatoria, Lisbon, Portugal, 1960.

#### SHARKS:

"Shark Attacks During 1959," by Perry W. Gilbert, Leonard P. Schultz, and Stewart Springer, article, *Science*, vol. 132, no. 3423, August 5, 1960, pp. 323-326, printed. American Association for the Advancement of Science, National Publishing Co., 1515 Massachusetts Ave., N. W., Washington 5, D. C.

#### SHRIMP:

"La Industria Mexicana del Camaron en el Pacifico" (The Mexican Shrimp Industry in the Pacific), by Hugo Loreda Hernandez, article, *Industrias Pesqueras*, vol. 34, nos. 793 and 794, May 15, 1960, pp. 154-155, 157-158, printed in Spanish. Industrias Pesqueras, Policarpo Sanz, 21-22, Vigo, Spain.

#### SMELT:

"Canada's Atlantic Smelt Fishery," by R. A. McKenzie, article, *Trade News*, vol. 13, no. 2, August 1960, pp. 3-8, illus., processed. Informational and Education Service, Department of Fisheries, Ottawa, Canada. Discusses the landings and value of the smelt fishery in Canada's Maritime Provinces and Quebec during the past 40 years. Also covers the commercial catch in the Miramichi River area, results of tag recoveries, and the nature of the smelt. Included are several charts showing distribution of smelt landings; size, age, and commercial grades in Miramichi smelt, kinds of smelt fishing nets used in various areas of the Maritime Provinces; and other pertinent data. During the last 40 years, the smelt landings on the Atlantic coast of Canada have averaged about 7 million pounds a year, and from 1952 to 1955 the average value was about \$825,000. There are various points in the life history of the smelt where management might benefit the survival, abundance, and usefulness of the stock.

#### SPAIN:

"Un Ensayo sobre Productividad y Reorganizacion de la Industria Conservera" (An Essay on Production and Reorganization of the Canning Industry), by



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Alevin, article, *Industria Conservera*, vol. 26, no. 252, June 1960, p. 153, printed in Spanish. *Industria Conservera*, Calle Marques de Valladares, 41, Vigo, Spain.

#### SPONGES:

Sponges, by Senji Tanita, Biological Results of the Japanese Antarctic Research Expedition No. 1, 10 pp., illus., printed, 50 yen (about 14 U. S. cents). Seto Marine Biological Laboratory, Sirahama, Wakayama-Ken, Japan, May 1959.

#### SWORDFISH:

"The Moisture Distribution in Frozen Meat of Swordfish During Cold Storage," by Yasuhiko Tsuchiya and Shizuo Uchimi, article, *Tohoku Journal of Agricultural Research*, vol. 10, March 1959, pp. 71-73, printed. *Tohoku Journal of Agricultural Research*, The Faculty of Agriculture, Sendai, Japan.

#### TAIWAN:

Fisheries of Taiwan, by T. P. Chen, 14 pp., illus., printed. Chinese-American Joint Commission on Rural Reconstruction, Taipei, Taiwan, July 1960. Describes briefly the geography of Taiwan, important commercial fish, administration and research institutions, fisheries training facilities, and fishermen's organizations. Also covers the deep-sea, inshore, and coastal fisheries; fish culture; fish processing; fisheries landings, 1952-59; and marketing of fisheries products.

#### TILAPIA:

"The Effect of Sexual Maturity on the Length-Weight Relationship of *Tilapia mossambica* (Peters)," by J. S. Kenny, article *West Indies Fisheries Bulletin*, no. 3, May/June 1960, pp. 1-16, illus., processed. Ministry of Natural Resources and Agriculture, Federal House, Port-of-Spain, Trinidad, W. I.

#### TUNA:

"Albacore Migration and Growth in the North Pacific Ocean as Estimated from Tag Recoveries," by Tamio Otsu, article, *Pacific Science*, vol. 14, no. 3, July 1960, printed. *Pacific Science*, University of Hawaii, Honolulu 14, Hawaii.

#### TURKEY:

*Balık ve Balıkçılık* (Fish and Fishery), vol. 8, nos. 1-2, January-February 1960, 48 pp., illus., printed in Turkish with English table of contents. *Balık ve Balıkçılık*, Kat 5, Yeni Valde Han, Sirkeci, Istanbul, Turkey. Includes, among others, these articles: "The Different Uses of Sharks (Part I)," by Fehmi Ersan; and "Anchovy and Its Catch," by Sitki Uner.

\_\_\_\_\_, vol. 8, no. 3, March 1960, 32 pp.; "The Different Uses of Sharks (Part II)," by Fehmi Ersan; and "Methods of Extraction of Oils from Fish Livers (Part I)," by Hikmet Akgunes.

\_\_\_\_\_, vol. 8, no. 4, April 1960, 32 pp.; "The Possibilities of Canning Various Types of Shark Meat," by Fehmi Ersan; "Methods of Extraction of Oils from Fish Livers (Part II)," by H. Akgunes; "Anchovy and Its Catch (Part II)," by Sitki Uner; and "On Fish Living in Hot Seas (Part I)." \_\_\_\_\_, vol. 8, no. 5, May 1960, 32 pp.; "On the Use of Fish Oils in Industry," by Fehmi Ersan; "On the Industrial Use of Raw Materials Extracted

from Fish," by Hikmet Gunes; "Preservation of Lobsters," by Sait Akgun; "On the Biology of the Shark," by Huseyin Uysal; and "On Fish Living in Hot Seas (Part II)." \_\_\_\_\_, vol. 8, no. 6, June 1960, 32 pp.; "Fishing Economy and the Importance of Fish Meals," by Fehmi Ersan; "Economic and Technical Aspects of Our Fish Canning Industry (Part I)," by A. Baki Ugur; "On Our Demersal and Pelagic Fishes," by Huseyin Uysal; "Tuna and Its Catch with Hook and Line (Part I)," and "A Short Survey of the History of Mackerel Canning Industry," by Sait Akgun.

\_\_\_\_\_, vol. 8, no. 7, July 1960, 32 pp.; "Tuna and Its Catch with Hook and Line (Part II)," by Sitki Uner; and "On Fish Traps in the Bosphorus and Surroundings (Part I)," by S. Aydinazici and A. Oker.

\_\_\_\_\_, vol. 8, no. 8, August 1960, 32 pp.; "On Fish Traps in the Bosphorus and Surroundings (Part II)," "Food Poisoning and Sea Products," by Dr. Orhan Demirhindi; and "The Role of Atomic Energy on Fish Biology."

#### UNESCO

*Marine Sciences Newsletter*, no. 1, November 1959, 23 pp., processed. UNESCO Science Cooperation Office for Southeast Asia, Djl. Diponegoro 76, Box 2313, Djakarta, Indonesia. A new publication of the UNESCO Science Cooperation Office for Southeast Asia, published irregularly. One important aim of UNESCO's program in the natural sciences is to contribute to improving living conditions of mankind by the promotion of scientific knowledge in order that a greater and better use may be made of natural resources. In Southeast Asia, of course, where there is an extremely extended coastline, development of marine sciences is of the greatest importance. To aid in this work, UNESCO established in 1956 the International Advisory Committee on Marine Sciences, whose task is to advise it on its program of research in the marine sciences. This issue of the *Newsletter* includes, among others, these articles: "International Oceanographic Congress and 4th Session of International Advisory Committee on Marine Sciences," "Symposium on Aulogy," and "Films on Fisheries and Marine Science."

\_\_\_\_\_, no. 2, March 1960, 29 pp., processed. Includes, among others, articles on: "Report on Marine Biology in the Central Indo-Pacific Region," by R. Serene; "Preparatory Meeting of the Inter-governmental Conference on Oceanographic Research;" "Regional Training Course in Marine Sciences;" "Scientific Conference on Disposal of Radio-Active Wastes;" and "International Indian Ocean Expedition."

#### UNITED KINGDOM:

*Fisheries of Scotland Report for 1959*, 100 pp., printed, 5s. 6d. (about 77 U. S. cents). Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland, July 1960. (Available from Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.) This report discusses the changes which took place in the Scottish fishing fleet during 1959 as well as details of the catch. It also includes in the appendices reports on fisheries research and harbors. A number of statistical tables are included in the report which deal with quantities and values of fish landed,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

number of vessels and fishermen engaged in the fisheries, and production of fishery byproducts. The Marine Laboratory at Aberdeen continued its investigations of herring, brown trout, and salmon. Emphasis in research was placed on the environmental aspects--hydrography, nutrients in the sea, and plankton and bottom fauna--and on chemical work--fertilization of lochs, phosphorus content of bottom deposits and macrophytes, and chemical changes in unpolluted rivers.

Scottish Sea Fisheries Statistical Tables, 1959, 48 pp., printed, 5s. (about 70 U. S. cents). Department of Agriculture and Fisheries for Scotland, Edinburgh 1, Scotland, July 15, 1960. (Available from Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.) Contains 24 statistical tables showing fish landed and cured, vessels and fishermen, and creek returns. Tables 1 through 17 cover quantity and value of fish landed by British and foreign vessels; landings of British vessels according to method of fishing, 1938-59; quantity, value, and average value of each kind of fish landed by British vessels in 1913, 1938, and 1952-59; and quantity and value of each kind of fish landed in specific districts by British vessels of various types. They also cover quantity of each kind of fish landed and expenditure of fishing effort in each fishing region by British vessels; quantity of each kind of fish landed by foreign vessels from each fishing region and quantity and value of fish landed by each nationality; and seasonal landings of herring. Tables 18 through 20 show quantity of herring cured, 1913-59 and quantity and value of white fish cured and herring cured in each district, according to method of cure. Tables 21 through 23 show fishing vessels; fishermen employed; and greatest number of vessels and persons employed in each district in any week. Table 24 shows number of vessels and fishermen and quantity and value of fish landed in creeks.

#### UNITED NATIONS:

U. S. Participation in the UN (Report by the President to the Congress for the Year 1959, 86th Congress, 2d Session), House Document No. 378, 298 pp., illus., printed. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., August 1960. The fourteenth annual report covering United States participation in the United Nations during the year 1959. Contains sections on maintenance of peace and security; economic and social cooperation and human rights; dependent territories; legal and constitutional developments; and budgetary, financial, and administrative matters. Includes a discussion of the work of the Food and Agriculture Organization, such as the holding of three international fisheries conferences, the aid of an FAO fisheries expert in developing a fish-farming research station in Arkansas, and the publication of a number of technical bulletins and reports on fisheries.

#### U. S. S. R.

The following English translations of foreign language articles are available only from:

The Fisheries Research Board of Canada,  
Biological Station, Nanaimo, B. C., Canada.

#### Certain Peculiarities in the Biology of Propagation and Development of the Salmonid Fish Nerka--ONCOR-

HYNCHUS NERKA (Walbaum), by A. I. Smirnov, Translation Series No. 229, 4 pp., processed, 1959. (Translated from Doklady Akademii Nauk SSSR, vol. 123, no. 2, 1958, pp. 371-374.)

The Effect of Mechanical Agitation on Developing Eggs of the Pink Salmon ONCORHYNCHUS GORBUSCHA (Walbaum), Salmonidae, by A. I. Smirnov. Translation Series No. 231, 5 pp., processed, 1959. (Translated from Doklady Akademii Nauk SSSR, vol. 97, no. 2, 1954, pp. 365-368.)

The Effect of Mechanical Agitation at Different Periods of Development on the Eggs of Autumn Chum Salmon (ONCORHYNCHUS KETA infrasp. AUTUMNALIS Berg, Salmonidae), by A. I. Smirnov, Translation Series No. 230, 5 pp., processed. (Translated from Doklady Akademii Nauk SSSR, vol. 105, no. 4, 1955, pp. 873-876.)

Hydro Construction in Siberia and Problems of the Fishing Industry, by B. G. Ioganzen and A. V. Podlesny, Translation Series No. 227, 6 pp., processed, 1959. (Translated from Rybnoe Khoziaistvo, vol. 11, November 1958, pp. 21-26.)

Intergeneric Hybridization of Pacific Salmon, by A. I. Smirnov, 2 pp., illus., processed 1960. (Translated from Priroda, vol. 6, June 1959, pp. 98-100.)

The Fisheries Research Board of Canada,  
Biological Station, St. Andrews, N. B., Canada.

Year-to-Year Changes in the Food of Cod in the Barents Sea, by N. S. Grinkevich, Translation Series No. 223, 21 pp., processed, 1959. (Translated from Trudy Pol'arnovo N.-I. Institut Morskovo Rybnovo Khoziaistva i Okeanografii (PINRO), no. 10, 1957, pp. 88-105.)

#### VENEZUELA:

"27,000 Tonelados de Sardinas al Ano Son Pescadas en Venezuela" (27,000 Tons of Sardines a Year are Landed in Venezuela), article, El Agricultor Venezolano, vol. 23, no. 217, March-April 1960, pp. 21-23, illus., printed in Spanish. El Agricultor Venezolano, Ministerio de Agricultura y Cria, Caracas, Venezuela.

#### VESSELS:

Standard Specifications for the Construction of Scottish Wooden Fishing Vessels, Overall Length 30 Feet to 90 Feet, Inclusive, 37 pp., illus., printed.

White Fish Authority, 5 Forres St., Edinburgh 3, Scotland, September 1960. The specifications described were drawn up by a working party of specialists appointed by the White Fish Authority's Committee for Scotland and Northern Ireland in 1956 after discussions with the Scottish inshore fishing industry and fishing vessel builders. They contain precise rules for the construction of various ranges of vessels within the over-all length, and prescribe standards for electrical equipment and the general outfitting of the vessels. Tables of dimensions and drawings are provided. An appendix sets out a recommended style for a detailed specification. Compliance with these specifications is to be a condition for grant and loan assistance by the Authority for wooden fishing vessels built in Scotland for Scottish owners.

#### WEATHER CHARTS:

Coastal Warning Facilities Charts, 1960, 12 charts, 2 pp. each, processed, 10 cents each, 1960. (For

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Weather Bureau, U. S. Department of Commerce, Washington 25, D. C. Charts show stations displaying storm warnings, small craft, storm and hurricane warnings and explanations, and schedules of AM and FM radio and TV stations that broadcast weather forecasts and warnings: 8P--Canadian Border to Eureka, Calif.; 9P--Cape Hatteras to Brunswick, Ga.; 10P--Eastport, Maine, to Montauk Point, N. Y.; 11P--Eureka to Point Conception, Calif.; 12P--Eastern Fla.; 13P--Hawaiian Islands; 14P--Manasquan, N. J., to Cape Hatteras and Chesapeake Bay; 15P--Montauk Point N. Y., to Manasquan N. J.; 16P--Morgan City, La., to Apalachicola, Fla.; 17P--Morgan City, La., to Brownsville, Texas; 18P--Point Conception, Calif., to Mexican Border; and 19P--Puerto Rico and Virgin Islands.

#### WHALE OIL:

"Epoxidation of Whale Oil," by N. A. Dybakova, E. N. Zilberman, and A. A. Berlin, article, *Trudy po Khimii i Khimicheskoi Tekhnologii*, vol. 1, 1958, pp. 679-681, printed in Russian. Nauchno-Issledovatel'skii Institut Khimii, Naberezhnaya im. Zhdanova, d. No. 11, Gorki, U. S. S. R.

#### WHALES:

"Amino-Acid Composition of Whale Meat," by Tetsuo Ogawa, Toshinao Tsunoda, and Makio Osawa, article, *Scientific Reports of the Whales Research Institute*, no. 13, 1958, pp. 303-307, printed. Whales Research Institute, Geirui Kenkyusho, 12-4, Tsukishima-Nishigashi-dori, Chuo-ku, Tokyo, Japan.

#### WHALING:

"Whaling Operations in the Antarctic, Season 1959/60," article, *Norsk Hvalfangst-Tidende* (Norwegian Whaling Gazette), vol. 49, no. 8, August 1960, pp. 351-380, illus., printed in Norwegian and English. Norsk Hvalfangst-Tidende, Sandefjord, Norway. A survey of the whaling operations in the Antarctic in the season 1959/60 prepared for and submitted at the meeting of the International Whaling Commission in London in June 1960. Covers the withdrawal of Norway and the Netherlands from the International Whaling Convention in July 1959, the most important regulations of the Convention, the number of factoryships and catching boats engaged in pelagic whaling since 1934/35, and their average gross tonnage, and the duration of the whaling period. Also discusses the catch and oil production of the individual expeditions, the catch results in relation to the vessels engaged in whaling and catching time spent, oil yield per blue-whale unit, sexually mature and immature whales, and ratio of blue and fin whales in the catch. Includes a number of statistical tables showing data on these topics.



#### COMMERCIAL-SCALE CANNING FIRST DEVELOPED IN THE UNITED STATES

"Canning was first developed on an extensive commercial scale in the United States and most of our pioneer canners were primarily packers of fish and seafoods; packing fruits, vegetables, and preserves as secondary or incidental items. Strangely enough, the packing of fishery products presents more difficulties than processing other types of foods." (*Principles and Methods in the Canning of Fishery Products*, Research Report No. 7, page 2, U. S. Fish and Wildlife Service.)



m



